

**Evaluating The Development of Scientific Knowledge and New Forms of Reading  
Comprehension During Online Learning**

**FINAL REPORT**

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## Evaluating The Development of Scientific Knowledge and New Forms of Reading Comprehension During Online Learning

Rapidly increasing Internet access in the nation's schools (National Center for Education Statistics [NCES], 2003) along with recent reviews of online learning (Cavanaugh, 2001; Cavanaugh, Gillan, Kromrey, Hess, & Blomeyer, 2004) provide important focus to a critical issue: How might we take optimal advantage of online learning opportunities in the schools of this nation to support learning? The term "online learning," however, means many things to many people, ranging from distance education classes to Internet integration in K-12 classrooms. Nearly all models of online learning, however, share a common element: They require students to read on the Internet.

Does online reading require the same skills as reading textbooks and other traditional sources of information? Recent work (Coiro, 2003; Educational Testing Services [ETS], 2003; Lankshear & Knobel, 2003; International Reading Association [IRA], 2002; Leu, Kinzer, Cammack, & Coiro, 2004; RAND, 2002) suggests that online reading comprehension may require new skills and strategies to effectively use the affordances of the Internet to read, comprehend, and learn new information. The report of the RAND Reading Study Group (2002) captures the essence of the problem: "... accessing the Internet makes large demands on individuals' literacy skills; in some cases, this new technology requires readers to have novel literacy skills, and little is known about how to analyze or teach those skills" (p. 4).

The new reading comprehension and communication skills required on the Internet have been referred to as "new literacies" (Leu et al., 2004), "ICT literacies" (ETS, 2003), "21<sup>st</sup> Century literacies" (SBC Knowledge Ventures, 2002), or "informational literacies" (Moore, 2002). This rapidly emerging area of work suggests that online learning is mediated by students' ability to read and communicate in online environments and that this requires new skills and strategies that go beyond what is required to read and communicate with traditional print technologies. Locating information and reading search engine results, for example, requires additional strategies and inferential reasoning skills not seen in traditional textbooks (Henry, in press).

Little empirical evidence, however, is available on the role of these new skills and strategies during online reading. One of the few studies in this area has demonstrated that there are important, new complexities to online reading comprehension that go beyond the skills required to comprehend traditional text (Coiro & Schmar-Dobler, 2005). Other work (Azevedo, & Cromley, 2004) suggests that instruction in self-regulated learning appears to promote learning in hypermedia. We have little or no information about the extent to which teaching these new skills might contribute to learning in a content area classroom where the Internet is used.

Teaching new online reading comprehension skills within content area classrooms is not an easy matter, however. Content teachers typically see their role as one of teaching content, not teaching reading (O'Brien, Stewart, & Moje, 1995). One finds resistance among content area teachers to include new elements, outside of their important responsibility to deliver content knowledge (IRA, 2002). Indeed, the slower pace of Internet integration in the secondary school curriculum (NCES, 2003) may also be a function of this concern.

Thus, it appears important to study issues surrounding online learning in content area classrooms to discover how to best integrate the Internet and the new reading comprehension skills that appear required, while still teaching the important conceptual knowledge of each discipline. Important issues surround the extent to which these should be taught in content area

classrooms so as not to jeopardize conceptual learning in each discipline. Should we intensively integrate the use of the Internet along with online comprehension skill instruction in content area classes each day or will less intensive integration be all that is necessary?

*Theoretical Framework: The New Literacies of the Internet and other ICTs*

We frame this investigation within a theoretical perspective informed by the work of the New Literacies Research Team at the University of Connecticut and others (Leu, Coiro, Lankshear, & Knobel, in development; Leu et al., 2004; Leu & Hartman, 2005) as well as an emerging line of work in online reading comprehension (Coiro, 2003; Coiro & Schmar-Dobler 2005; Henry, in press; Leu, Leu, & Coiro, 2004). According to this perspective, five important skill areas become important for successful online reading comprehension and Internet use:

“The new literacies of the Internet and other ICTs include the skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives. These new literacies allow us to use the Internet and other ICTs to *identify important questions, locate information, analyze the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to others* (italics added).” (Leu, Kinzer, Coiro, & Cammack, 2004, p. 1570)

In addition, a number of important principles also inform this perspective about online reading and writing:

1. The Internet and other ICT are central technologies for literacy within a global community in an information age.
2. The Internet and other ICT require new literacies to fully access their potential.
3. New literacies are deictic.
4. The relationship between literacy and technology is transactional.
5. New literacies are multiple in nature.
6. Critical literacies are central to the new literacies.
7. New forms of strategic knowledge are central to the new literacies.
8. Speed counts in important ways within the new literacies.
9. Learning often is socially constructed within new literacies.
10. Teachers become more important, though their role changes, within new literacy classrooms.

(Leu, Kinzer, Coiro, & Cammack, 2004, p. 1587)

Others use different labels to capture a common theoretical structure within which to understand the changes that take place to reading comprehension online. Educational Testing Services [ETS] (2003) uses a related construct, ICT literacy, and defines this as: “...using digital technology, communication tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society.” (p. 2). Other constructs, too, focus in a similar fashion on the new skills required to search, critically evaluate, synthesize, and communicate information, ranging from 21<sup>st</sup> Century Skills (Partnership for 21<sup>st</sup> Century Skills, 2003) to the Big 6 (Eisenberg & Berkowitz, 2002). All suggest that online reading comprehension and learning center around these common skill areas. Thus, in developing both

the instruction and the assessments for this study, we paid particular attention to students' ability to read and learn from online information while searching, critically evaluating, synthesizing, and communicating.

*Studying Online Learning within a New Literacies Perspective*

As schools manifest different needs, it is likely that a variety of distance education models for instruction will become common. Some students will take courses that are offered completely online and others will access the Internet as an integral part of their content area learning experience. In all of these cases, however, students read on the Internet in order to learn. Thus, as online learning opportunities become increasingly available to schools and students, it is essential to understand how best to support the development of the new reading comprehension skills they require of all students (IRA, 2003). This is especially important for at least two reasons. First, academic achievement is dependent on the ability to read and comprehend at high levels (Alexander & Jetton, 2002; Bransford, Brown, & Cocking, 2000). Second, school learning of content area information will be increasingly derived from information on the Internet (Partnership for 21<sup>st</sup> Century Skills, 2003).

This study evaluated the effects of varying the intensity of Internet integration into classroom science instruction. Intensity of integration was defined by the duration of Internet access as well as by the duration of instruction in the new literacies of online reading comprehension. We sought to evaluate the consequences of this integration on online reading comprehension, science learning, and traditional reading comprehension. To measure online reading comprehension, we refined two different assessments grounded in a new literacies perspective and carefully evaluated their psychometric properties. Science learning was measured using measures of simple declarative knowledge (multiple choice tests) and deeper conceptual understanding (student-generated concept maps) for human body systems. Standardized reading achievement scores were used to assess traditional reading comprehension. Each of these measures was administered over the course of the study to determine ongoing skill development as well as differences between treatment conditions.

To teach the literacies of online reading comprehension, we adapted Reciprocal Teaching (Palincsar, 1986; Palincsar & Brown, 1984), an instructional model that is widely recognized as having the largest effect size in comprehension instruction research (Rosenshine & Meister, 1994). We refer to this adaptation as Internet Reciprocal Teaching. We expected that the greater the intensity of instruction and Internet integration into these science classrooms, the more we would see gains in online reading comprehension, science learning, and traditional reading comprehension.

*Why did we select 7<sup>th</sup> grade students?* Increasing attention has focused on the reading and learning of adolescent youth (Biancarosa & Snow, 2004; IRA, 1999). Learning in middle and high school is determined largely by one's reading comprehension ability, yet many adolescents struggle with comprehension. According to the National Assessment of Educational Progress [NAEP], only 32% of eighth grade students read at or above the proficient level (U.S. Department of Education, 2003). Most importantly, the achievement gap is increasing between high and low performing students in reading. Since 1992, NAEP average reading scores for high-performing students have increased, while those for low-performing students have dropped (U.S. Department of Education, 2003). In addition, since reading comprehension on the Internet requires new, more complex skills and strategies (Coiro & Schmar-Dobler, 2005) and lower achieving readers often have the least access at home to the Internet (Warschauer, 2003), it is

likely that the gap between higher and lower achieving readers may increase even faster as the Internet becomes more common in school learning contexts.

Research also indicates that adolescents with limited reading comprehension skills struggle with learning in school and are more likely to drop out (Finn, 1989; 1993; Wylie & Hunter, 1994), thus limiting their ability to fully seize life's opportunities for themselves and limiting their contributions to society (Thompson, Mixon, & Serpell, 1996). Unless we quickly begin a systematic series of investigations to better understand the effects of instruction in online reading comprehension, the growing gap in reading achievement is likely to present a fundamental challenge to any society that professes egalitarian ideals and equal opportunity for all its citizens.

*Why did we select a science classroom?* In an age in which global, national, and individual opportunity is often associated with scientific progress, science education and scientific literacy have become increasingly important to all of us (National Research Council, 1996). Traditionally, science education has sought to focus the development of scientific thinking through experiments and other more hands-on experiences. More recently, national reports and standards for science education (National Research Council, 1996) have included the ability to learn from all interactions with informational resources, many of which require reading and learning from new information technologies such as the Internet. As a result, policy initiatives that integrate science learning with online information resources, simulations, and modeling have been promoted through research initiatives such as the Information Technology Experiences for Students and Teachers (ITEST) program (National Science Foundation, 2004).

The integration of online information resources may be especially appropriate during the study of human body systems, an area commonly found in the seventh grade science curriculum and one that is not as systematically amenable to experimental approaches in the classroom beyond simple activities such as associating exercise with pulse and respiratory rate. Online information resources provide a far richer set of animations, human system models, and information about each of the human body systems than may be found in most textbooks. Thus, the Internet provides many useful resources to help students understand the functioning of human body systems, the unit of study for the classes that we had selected.

*Why did we adapt Reciprocal Teaching as an instructional strategy for teaching the new literacies of the Internet?* It appears that much of the new knowledge readers require during online reading comprehension is strategic. New strategies are required to locate, critically evaluate, synthesize, and communicate information online (Coiro, 2003; Leu et al., 2004). In addition, online readers must regularly assess the appropriateness of the text they are constructing, through the choices they make about where to go and what to read (Coiro & Schmar-Dobler, 2005). Azevedo & Cromley (2004) similarly report that learning online involves strategic comprehension monitoring or self-regulation. Thus, it seemed most appropriate to search for an instructional model with proven efficacy at teaching reading comprehension strategies and improving reading comprehension, especially among adolescents.

Reciprocal teaching seems well suited to develop strategic, engaged reading on the Internet because it seeks to increase reading comprehension by developing greater self-regulated reading among individuals. A meta-analysis of reciprocal teaching studies indicated that substantial effect sizes were obtained on comprehension skill development when this approach was used (Rosenshine & Meister, 1994). Thus, it seemed appropriate to adapt this approach to teach the new comprehension skills and strategies required to locate, critically evaluate, synthesize, and communicate information on the Internet.

*Why did we seek to measure traditional reading comprehension?* We included the measurement of traditional reading comprehension in the design of this study for two reasons. First, we wanted to evaluate the extent to which traditional reading comprehension performance correlated with online reading comprehension. It would seem important to evaluate the hypothesis that online reading comprehension consists of skills that do not correlate highly with traditional reading comprehension.

If the skills and strategies required to read on the Internet are actually different from the skills and strategies required while reading traditional texts, there should be little or no significant association between traditional and online reading assessments. This would provide limited support for the belief that new reading skills are required for online reading comprehension. Demonstrating this would provide explanatory power to any changes in science knowledge resulting from the use of Internet resources. On the other hand, if the two measures are highly correlated *and* gains in science learning appear, this would seem to suggest that other elements of online reading, perhaps greater engagement, produced these gains in science learning. Thus, we sought to evaluate the relationships between assessments of traditional reading and online reading in order to provide important interpretative data for the results of our study on science learning.

We also had a second purpose in collecting traditional comprehension achievement data. Instruction in the new literacies of online reading comprehension should improve online reading ability and thus, increase learning but it may also increase more traditional reading comprehension. There is a recent hypothesis (Leu & Reinking, 2004) that instruction in the higher-level comprehension skills required on the Internet will impact traditional reading performance and improve traditional reading comprehension.

For both reasons, then, we included a standardized measure of traditional text reading comprehension. We sought to evaluate the extent to which traditional reading and online reading were correlated. We also sought to determine if traditional reading comprehension improved because of the greater skill in higher-level thinking that online reading prompts.

*Why should we evaluate the consequences of varying the intensity of integrating these new literacies?* Teaching online comprehension strategies during content area instruction comes at a price: time taken away from instruction devoted specifically to content. This is a common concern of all content area teachers (Vacca & Vacca, 2004), even when the argument is made that reading skills taught within the content of instruction does not take time away from content area learning (O'Brien, Stewart, and Moje, 1995). Thus, two important questions become: (1) How much time should we devote to Internet use and strategy instruction within content area instruction? and (2) Is there a minimum level of Internet use and instruction required to achieve learning gains? Discovering answers to these questions would inform school leadership teams, teacher education, and professional development initiatives seeking to integrate the Internet into classroom instruction.

To address these questions, we evaluated four different levels of the intensity and duration of Internet integration in seventh-grade science classrooms: (1) Internet use with intensive strategy instruction, (2) Internet use with moderate strategy instruction, (3) Internet use with no strategy instruction, and (4) no Internet use with no strategy instruction (control). We sought to determine how much, or how little, instruction in online reading comprehension strategies would be required to produce gains in science learning.

*Research Questions*

Three sets of research questions were studied: questions related to changes in online reading comprehension performance; questions related to science content learning; and questions related to traditional reading comprehension performance:

Changes in online reading comprehension performance.

RQ1a: Do students who receive different intensity levels of Internet integration during science class have different profiles, over time, of online reading comprehension compared to students who receive regular classroom instruction, without the Internet?

RQ1b: Do students who receive different intensity levels of Internet integration during science class perform better on a test of online reading comprehension compared to students who receive regular classroom instruction, without the Internet?

Changes in science content learning.

RQ2: Do students who receive different intensity levels of Internet integration during science class perform better on measures of science content learning?

Traditional reading comprehension performance.

RQ3a: Is there a significant relationship between performance on an assessment of traditional reading comprehension and performance on an assessment of online reading comprehension?

RQ3b: Do students who receive different intensity levels of Internet integration during science class perform better on an assessment of traditional reading comprehension compared to students who receive regular classroom instruction, without the Internet?

The answers to these questions will help us to better understand the complexities associated with online learning studies and provide important insights into understanding the role of online reading comprehension during content area instruction. This work should also help in the development of more psychometrically sound assessment instruments for measuring online reading comprehension.

## METHOD

A middle school with approximately 416 students in a district in suburban/rural New England agreed to participate in this study. Minority enrollment in the district was 4%. The community had a total population of 10,417 with 87% of the adults possessing at least a high school diploma. In 2001, 82% of the teachers in this district possessed a master's degree. Only 3.7% of students at the middle school were estimated to be eligible for free and/or reduced-price lunch in 2001. Only 1% spoke a primary home language other than English. The average class size in the 7<sup>th</sup> grade was 23.8 students in 2001 and approximately 12% of students were enrolled in special programs, largely special education (Public School Review, 2005).

The district identified a 7<sup>th</sup> grade science teacher to participate in this study and she agreed to do so. The teacher had completed an undergraduate degree in science education, possessed a teaching credential, and had 3.5 years of previous teaching experience in science

education. This teacher taught four of the six sections in science education at the 7<sup>th</sup> grade level at this school. Each section had approximately 22 students.

### *Participants*

Participants in this study were 89 seventh-grade students (42 males; 47 females), in four of the six sections of science at this school. All were taught by the participating teacher. Seventy-four of the participating students received no additional instructional support while 15 received instructional support delivered by a trained special education team. Special education support services were delivered in the classroom and followed the classroom teacher's standards-based curriculum. Class size ranged between 20 and 24 students in each section. The mean age of the students in the sample was 13 years, 4 months. The mean total raw score for the January administration of the Degrees of Reading Power, Form J (2004), a test of reading achievement, was 50.31 (S.D. = 12.95). The mean p. = 90 conversion scores for independent reading level on the same test was 53.67 (S.D. = 14.98). This equates to being able to read, independently, an easier middle school textbook or literature such as *Island of the Blue Dolphins* (Touchstone Applied Science Associates, 2004).

### *Conditions*

There were four conditions in this study, representing four levels of intensity of Internet integration in the classroom: (1) Internet use with intensive strategy instruction, (2) Internet use with moderate strategy instruction, (3) Internet use with no strategy instruction, and (4) no Internet use and no strategy instruction but regular classroom instruction (control). Assignment to condition was determined randomly at the class level. The University of Connecticut contributed a computer cart containing 25 wireless laptops so the Internet could be accessed in the classroom for instruction. Table 1 shows the levels of Internet integration by condition.

Table 1.  
*Treatment conditions and levels of Internet integration.*

| Condition                               | Operational Definition   |  |
|---|--|--|
| High-Intensity Internet Integration     | 12 weeks of Internet use with Internet Reciprocal Teaching   |  |
| Moderate-Intensity Internet Integration | 5 weeks of Internet use with no Internet Reciprocal Teaching                                       | 7 weeks of Internet use with Internet Reciprocal Teaching    |
| Low-Intensity Internet Integration      | 5 weeks of no Internet use   | 7 weeks of Internet use with no Internet Reciprocal Teaching |
| Regular Classroom Instruction (control) | 12 weeks of regular classroom instruction with no Internet use and no Internet Reciprocal Teaching |  |



*High-Intensity Internet Integration.* This group was taught by the participating classroom teacher in conjunction with a researcher from the New Literacies Research Team and included a substantial population of exceptional students (n=6). Students in this condition (n=24) were instructed using Internet resources as the primary means of teaching human body systems content. Units included the circulatory system, digestive system, cardiovascular system, respiratory system, and a short review unit that integrated all of these systems. Over a twelve-week period, students received whole-class instruction 4-5 times a week using an instructional method called Internet Reciprocal Teaching. Strategy lessons included searching for information, reading search engine results, evaluating information found on websites, and sharing online resources using email and weblogs. Appendix A contains Internet Reciprocal Teaching strategies introduced during instruction.

Daily lessons included a strategy demonstration, an opportunity to practice the strategy cooperatively in small groups, and a whole group strategy discussion. While searching for information and reading sites, students used information evaluation strategies and were encouraged to examine the most reliable and valid sites they could find. These evaluation strategies included determining which websites were the best resources for their purpose, verifying the accuracy of information found on the sites they chose, locating the site's creator, and reading with a critical eye. Strategies for locating, examining, and evaluating resources were discussed both in class and online.

Each class began with a review of the previous day's content, followed by an introduction to a new online comprehension strategy. After a 10 minute introduction, students worked in small groups for 15-20 minutes to apply the new strategy to the content being studied. During this time, students cooperatively completed activities such as Internet search puzzles (e.g., when given images, phrases, or other clues, students located specific websites and discussed their search and locate strategies). Other activities requiring interaction with online human body resources were also completed. Internet Reciprocal Teaching lessons concluded with a brief discussion of concepts examined and strategies used. Occasionally, small groups demonstrated their application of new strategies to the whole class in order to share and exchange new insights with other classmates. Strategies for synthesizing content information across a wide variety of animations, hypertexts, diagrams, graphs and charts became a focus of instruction as the study progressed.

Throughout the course of the twelve-week intervention, instruction in Internet Reciprocal Teaching encouraged students to follow unique informational paths when reading online, rather than a common linear path more typical of traditional text. Individual students varied in their (a) navigational choices; (b) purposes for information gathering, and (c) interest level in the materials. In addition, each student read different texts and met different reading challenges.

Each instructional unit included opportunities for students to examine online animations, interactive websites and other online resources related to human body systems. Five end of unit projects were assigned that involved application and synthesis of scientific knowledge learned. These projects included the production of a circulatory system brochure, respiratory scientist poster, cardiovascular persuasive essay, digestive system PowerPoint presentation, and a medical mysteries problem solving investigation. Appendix B contains descriptions of projects completed. Appendix C contains an instructional timeline of units taught and assessments administered.

*Moderate-Intensity Internet Integration.* This group was taught by the classroom teacher in conjunction with a researcher from the New Literacies Research Team and included no

exceptional students. Students in this condition (n=21) were instructed using Internet resources as the primary means of content delivery. During an initial period lasting five weeks, students used the Internet in the classroom, but strategies were not introduced and Internet Reciprocal Teaching was not implemented. Instead, students examined websites provided by the teacher and located resources needed to complete end-of-unit projects (circulatory system brochure, respiratory scientist poster, cardiovascular persuasive essay, digestive system PowerPoint presentation, and completion of a medical mysteries problem solving investigation). After the initial five-week period without strategy instruction, the class participated in whole-class instruction in new literacies skills and strategies using Internet Reciprocal Teaching. Internet Reciprocal Teaching was implemented for a total of seven weeks. Strategy instruction focused on locating information, critically evaluating information, synthesizing and communicating information in the context of completing unit projects. Discussion and demonstration of strategies occurred three times per week.

*Low-Intensity Internet Integration.* This group (n=22) was taught by the regular classroom teacher in conjunction with a researcher from the New Literacies Research Team and included a small population of exceptional students (n=2). During an initial period lasting five weeks, instruction involved the use of the science textbook (the Prentice Hall 2000 edition of *Human Biology and Health* for 7<sup>th</sup> grade) and also included the exploration of encyclopedias, library books, and other informational resources. During this period the Internet was not used. Over the remaining seven weeks of the study, this group examined online animations and interactive websites provided by the teacher. On their own, without instruction, students also located resources needed to complete end of unit projects (circulatory system brochure, respiratory scientist poster, cardiovascular persuasive essay, digestive system PowerPoint presentation, and medical mysteries problem solving investigation). This group was not taught skills and strategies for the use of the Internet, nor did they take part in Internet Reciprocal Teaching. No formal instruction occurred with regard to how to conduct searches, find information, read information, or share information with others.

*Control (No Internet use with no strategy instruction)* This group (n = 22) was taught solely by an experienced and highly effective classroom teacher and included a substantial population of exceptional students (n=7). The teacher was a content expert in human anatomy and physiology and was highly respected in the school district for accomplishing high levels of science learning in her classes. Regular classroom instruction focused on textbook reading and lab activities. The science text, the Prentice Hall 2000 edition of *Human Biology and Health* for 7<sup>th</sup> grade, contained units covering the digestive, circulatory and respiratory systems and contained reading selections that introduced both anatomy and physiology concepts. Within the text's 12-15 page overview of each system, students investigated diagrams and answered focus questions. The teacher's edition provided objectives, formal lessons, and extension ideas. Student worksheets taken from the text's black-line master practice book were used for class work and homework activities. Appendix D contains a collection of worksheets completed in the control classroom.

On a daily basis, instruction in the control classroom began with an oral review of the previous day's lesson. Using a process known as Question, Response, Evaluation (QRE) (Afflerbach, 1997), the teacher called on individual students to provide answers to close ended questions and evaluated their responses. After correcting the students, the teacher provided the whole class extended explanation as needed to clarify the concepts. QRE was then followed by

the introduction of a new science concept. During this part of daily instruction, students completed an individual or small group paper and pencil activity. Activities included the examination of diagrams and images, the completion of classroom labs, and culminating content area-learning projects (circulatory system newspaper advertisement, respiratory scientist poster, cardiovascular extended lab, digestive system model, and medical mysteries problem solving investigation). After having completed each day's activity, a summary of content covered was presented orally by the teacher. In this condition, neither the students nor the teacher used the Internet in the classroom. Students were not taught skills and strategies for the use of the Internet, nor did they participate in Internet Reciprocal Teaching.

#### *Major Dependent Variables of Interest*

The major dependant variables in this study are presented in the following order: (1) those related to online reading comprehension; (2) those related to science knowledge and (3) those related to traditional reading comprehension.

*Online reading comprehension.* We developed protocols and rubrics for two different measures of online reading comprehension: one using instant messaging technology and one using weblog (blog) technologies. Each was pilot tested and revised over a period of time. Each included tasks that measured students' abilities to locate, critically evaluate, synthesize, and communicate information on the Internet. Appendix E contains online reading comprehension protocols and evaluation rubrics for each administration.

The first measure was the *Online Reading Comprehension Assessment with Instant Messaging (ORCA-IM)* (New Literacies Research Team, 2005a). *ORCA-IM* included 15 open-ended items constructed to measure search and location, evaluation, synthesis, and communication of information. Three versions, with slightly different content about the Solar System, a unit the class had recently completed, were developed. Each measure included four tasks and was limited to 40 minutes. Time 1, Time 2 and Time 3 administrations were almost identical except for slight changes in the information that students were asked to locate, evaluate, and synthesize. The responses to each item were scored polytomously from Camtasia recording of online screen behavior. An example of a Camtasia video and one student's performance on *ORCA-IM* may be viewed at <http://ctell1.uconn.edu/ORCA/IM.htm>

*ORCA-IM* was administered to one high, average, and low achieving student in each class during three repeated time periods spaced at relatively equal intervals. It was first administered the week before intervention began, again 5 weeks later in the middle of the intervention and a third time after 10 weeks of intervention. The maximum score on this assessment was 38. Scores ranged from 3-33 (Time 1), 4-33 (Time 2), and 8-36 (Time 3). In the seventh week of instruction, one student switched classes and was removed from this part of the study.

Inter-rater reliability was established on a 51% subset of the 35 scores. To establish reliability, two scorers independently rated 18 assessments according to a rubric. Two raters scored all 11 pre-tests, 3 randomly selected tests from the second administration, and 3 randomly selected texts from the third administration. After conversation about discrepancies, the two scorers were in 100% agreement. One rater then scored the final 18 assessments independently.

The item scores for each instrument were submitted to a principal components analysis. The results for each of the instruments supported one composite explaining over 66 percent of the variance in scores each time. Table 2 reports the specific results of each analysis.

Table 2.

Results from the principal components analysis for the four tasks in the ORCA-IM for times 1-3

| Test Administration | Task 1 Load | Task 2 Load | Task 3 Load | Task 4 Load | % of Variance Explained |
|---------------------|-------------|-------------|-------------|-------------|-------------------------|
| Time 1              | .742        | .860        | .768        | .884        | 66.51                   |
| Time 2              | .915        | .880        | .860        | .618        | 68.31                   |
| Time 3              | .944        | .965        | .661        | .756        | 70.76                   |

An internal consistency estimate of reliability was computed for each of the three Online Reading Comprehension Assessments. Based on the Cronbach's alpha procedure, the reliability coefficient for scores on the 15 items was .91 for Time 1, .86 for Time 2, and .85 for Time 3, each indicating satisfactory internal consistency.

The second measure of online reading comprehension was called the *Online Reading Comprehension Assessment with Blog (ORCA-Blog)* (New Literacies Research Team, 2005b). The *ORCA-Blog* included three information requests posted on a blog site by fictitious teachers requesting online resources for human body systems, the content these classes had covered. An example of this assessment appears at: [http://newliteracies.typepad.com/science\\_exchange/](http://newliteracies.typepad.com/science_exchange/). The requests required students to query search engines, locate relevant information, evaluate and synthesize the information, and communicate their responses by posting on the blog. The three blog requests contained a total of 10 open-ended items.

The *ORCA-Blog* was administered to 89 students, the total population of all treatment groups, at the conclusion of the study. The administration was standardized and students were given 30 minutes to post their responses to the 3 requests. The maximum score on this assessment was 32. Scores ranged from 0-30.

Inter-rater reliability was established using a 20% subset of the total sample. Two scorers independently rated the same 18 students (4-5 from each condition) using a rubric specially designed to measure proficiency on this task. The independent raters were in 98% agreement on scores of the sub-sample. After establishing reliability, each rater scored the final 71 assessments, discussing discrepancies as they occurred and resolving differences through discussion. Appendix F contains the inter-rater reliability comparisons for this assessment.

The responses to each item in the *ORCA-Blog* were scored polytomously. An example of a Camtasia video and one student's performance on ORCA-Blog may be viewed at <http://ctell1.uconn.edu/ORCA/Blog.htm>

The item scores were submitted to a principal components analysis. The results support one composite explaining 59.22 percent of the variance in scores. The Cronbach's alpha reliability coefficient on the 10 items was .84, indicating adequate internal consistency. Table 3 presents the factor loadings from the principal components analysis for OCRA-Blog.

Table 3.

Results from the principal components analysis for the three tasks included in the ORCA-Blog.

|           | Task 1 Load | Task 2 Load | Task 3 Load | % of Variance Explained |
|-----------|-------------|-------------|-------------|-------------------------|
| ORCA-Blog | .631        | .861        | .789        | 59.22                   |

*Science knowledge.* We constructed two sets of science knowledge measures. The first set measured *declarative knowledge* (Alexander, 1997; 2003) of the three units on human body systems that were studied. The New Literacies Research Team and the classroom teacher constructed multiple choice and short answer quizzes for each body system cooperatively. Quiz questions were gathered from teacher resources provided with the Prentice Hall (2000) textbook, *Human Biology and Health* for grade 7. Appendix G contains the human body quizzes administered during this study. All items on the quizzes were dichotomously scored. The classroom teacher and the New Literacies Research Team each took responsibility for scoring a portion of the quizzes for each body system unit. Each paper received both a raw score (total circulatory = 29; total respiratory = 27; total digestive = 34; overall total = 90) and a percentage score (out of a total number possible in each quiz). In all further analyses, percentage scores were used. Percentage scores on each of the three quizzes ranged from 11 to 100.

Thus, the declarative knowledge measure included three multiple-choice scales that evaluated factual knowledge acquisition about the circulatory, respiratory, and digestive systems. The items were constructed to represent basic anatomy and physiology facts about each system. Each item was scored dichotomously. Scores were tallied to create three topic area subscale scores. The three topic area pretest scores reduced into one factor based on a principal components analysis explaining 59.00 percent of the variance in scores. The Cronbach's alpha reliability coefficient of the three total scores was .62. In addition, a test-retest stability coefficient was calculated. The test-retest stability coefficient based on pre- and post-outcomes was .86 supporting the consistency of scores over time.

Another set of measures served as a means to evaluate students' *conceptual knowledge* (Alexander, 1997; 2003) of the human body systems they studied. We viewed conceptual knowledge as a deeper form of science knowledge than declarative knowledge, for students had to demonstrate the links and connections among anatomical and physiological facts about the human systems. Concept maps for the three topic areas (i.e., circulatory, respiratory, digestive systems) and a map that integrated all three systems were collected and coded as pre- and post-measures of a second type of science knowledge. Procedures followed those suggested by Azevedo & Cromley (2004), Chi, de Leeuw, Chiu, & LaVancher, (1994); Chi, Siler, Jeong, Yamauchi, & Hausmann (2001), and Schrader, Leu, Kinzer, Ataya, Teale, Labbo, & Cammack (2003).

Each of the four concept maps was scored in relation to an experts' map (concept maps created by the teacher who completed the identical task as the students), following procedures suggested by Novak and Gowin, (1984) and Novak and Musonda (1991) that combined both concepts and relationships (propositions). Students received one point for each item that conceptually matched a similar item in the teacher's concept map; items had to be placed in a similar relationship. Appendix H contains annotated examples of concept map scoring.

Two raters independently scored 100 % of the concept map assessments using a commonly agreed upon set of decision rules. To establish these decision rules, a 30% subset of 40 concept maps, 10 from each class, were scored together and discussed thoroughly. Discussions led to a common interpretation of the decision rules that remained constant throughout scoring.

Once the decision rules were in place, each rater independently scored each system for all four classes (n=89) and exchanged scores with the other rater. Discussion occurred as results were compared. The two raters discussed differences in scoring until 100% agreement was reached on all concept maps.

We also submitted the pretest concept map scores to a principal components analysis to determine if the separate circulatory, respiratory, digestive values and integrated scores could be collapsed into one composite score. One factor emerged explaining 63.51 percent of the variance. Cronbach's alpha for the four concept map scores was .79 and the test-retest reliability coefficient was .60.

*Traditional Reading Comprehension.* Traditional reading comprehension was measured using the *Degrees of Reading Power* (DRP) assessment instrument, which is administered as part of the Connecticut Mastery Test. The Connecticut Mastery Test is an assessment used throughout the state by all school districts to measure reading achievement and annual gains in performance. The Degrees of Reading Power (DRP) test (Touchstone Applied Science Associates, 2004), is a criterion-referenced measure used widely as a measure of reading comprehension throughout the nation. The psychometric properties of the DRP indicate that it possesses a high level of reliability as measured by both Kuder Richardson (KR-20 = .95) and test-retest reliability measures ( $r = .95$ ); it also possesses high levels of construct and criterion-related validity (Koslin, Zeno, and Koslin, 1987).

The DRP was used to measure the general reading comprehension ability of students in our sample. We administered the assessment immediately prior to and after the intervention period, in January and June, using alternate forms J and K of this instrument. We used raw scores in all analyses. Raw scores on the January administration (Form J) ranged from 13 - 70 for all students in the study. In terms of independent reading level ( $p=.90$  scores), this means that individuals ranged from being able to independently read books that were easier than *Green Eggs and Ham* to being able to read books harder than *The Adventure of Don Quixote* (Touchstone Applied Science Associates, 2004).

## ANALYSIS AND RESULTS

Prior to running all statistical analyses, distributions were inspected for approximate normality. There were no major departures in normality. Thus, we proceeded with single subject and parametric analyses. Visual analyses were used to address research question 1a and parametric procedures were used to address research questions 1b, 2, 3a and 3b.

### *Changes in Online Reading Comprehension Performance*

We took two approaches to evaluating the effects of the intensity of Internet integration on changes to online reading comprehension performance. The first approach used the ORCA-IM to evaluate a small sample of students at multiple time periods with a design from single subject research traditions (Valencia, Stallman, Commeyras, Pearson, & Hartman, 1991; Neuman & McCormick, 1995). One student from high, average, and low achievement levels in each of the four treatment conditions was selected for this analysis. The second approach evaluated all students in all conditions at the end of treatment using the ORCA-Blog and parametric methods.

*ORCA-IM Results.* Since ORCA-IM (New Literacies Research Team, 2005a) required two test administrators for each individual student, we lacked sufficient resources to assess all students at pre-, during, and post-treatment periods. As a result, we used ORCA-IM to evaluate a small set of students from each treatment condition, using a single subject design and visual analysis to address the first research question:

*RQ1a: Do students who receive different intensity levels of Internet integration during science class have different profiles, over time, of online reading comprehension compared to students who receive regular classroom instruction, without the Internet?*

We used both science and reading achievement to select one high, average, and low achievement student from each of the four conditions. Science achievement was determined using the classroom teacher's ranking of students in each section. Using this ranked list as a starting point, students' scores on the Fall 2004 administration of DRP were examined to determine the class range and median. Those students with scores in the high and low quartile range on both the science and reading measure, as well as those students with scores at the median on both measures were inspected more closely. In each condition, the lowest achieving science student was also the lowest achieving reader and the highest achieving science student was also the highest achieving reader. In addition, the median student in science was also the median student in reading for each condition. Thus, for the ORCA-IM evaluation, this process resulted in our selection of twelve students, one high achieving, one average achieving, and one low achieving, in each condition based on both science and reading achievement. During the course of the study, one average student in the group that was online for 7 weeks without strategy instruction changed classes and had to be dropped from the analysis. This resulted in a sample of 11 students for this analysis.

ORCA-IM was administered the week before intervention to establish baseline performance, again 5 weeks later in the middle of the intervention, and a third time after 10 weeks of intervention. In each condition, mean scores for high, average, and low students were calculated. Analysis consisted of a visual evaluation of changes over time, as a result of condition and achievement level. The visual representation of these scores, by condition and time, is presented Figure 1. Means and standard deviations are presented in Table 4.

Figure 1.

Mean online reading comprehension scores (ORCA-IM) of the three students in each condition at three different times.

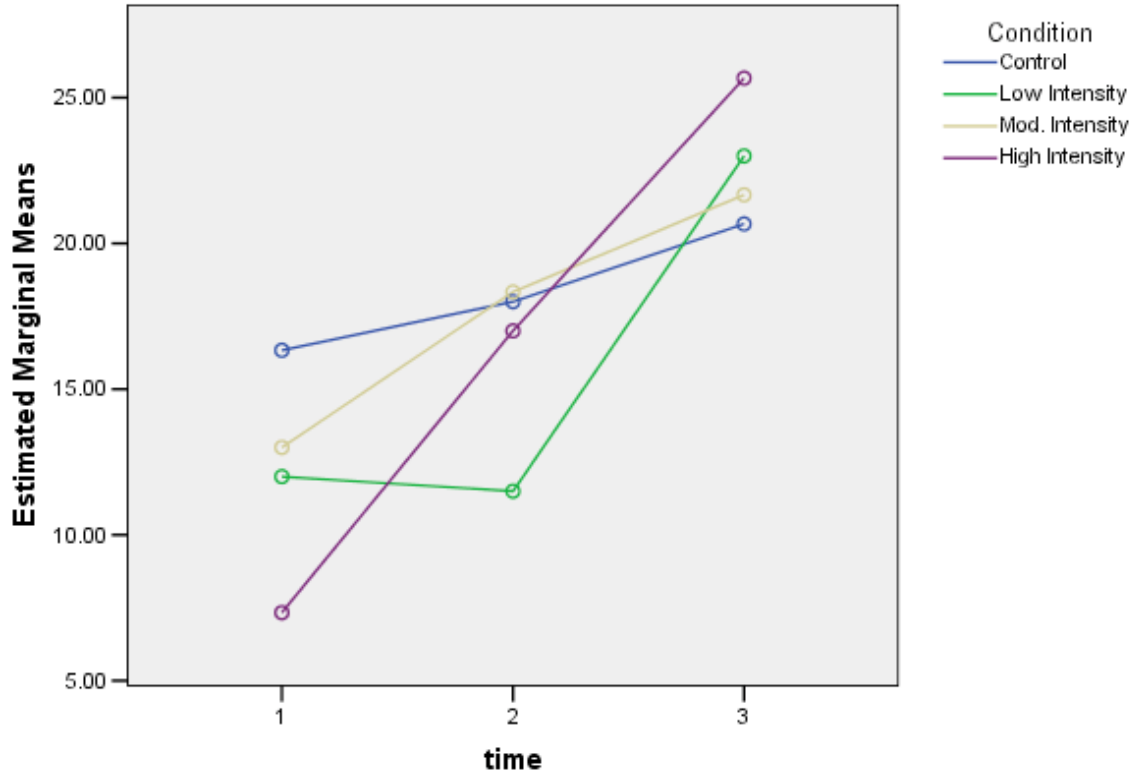


Table 4.

Online Reading Comprehension (ORCA-IM) Means and Standard Deviations (S.D.) by Classroom Condition and Time of Test

|        | Control<br>n=3 | Low Intensity<br>n=2 | Mod. Intensity<br>n=3 | High Intensity<br>n=3 | Total<br>n=11 |
|--------|----------------|----------------------|-----------------------|-----------------------|---------------|
| Time 1 | 16.33          | 12.00                | 13.00                 | 7.33                  | 12.18         |
| (S.D.) | (15.0)         | (9.9)                | (8.7)                 | (0.6)                 | (9.1)         |
| Time 2 | 18.00          | 11.50                | 18.33                 | 17.00                 | 16.64         |
| (S.D.) | (14.5)         | (6.4)                | (5.5)                 | (2.0)                 | (7.7)         |
| Time 3 | 20.67          | 23.00                | 21.67                 | 25.67                 | 22.73         |
| (S.D.) | (11.4)         | (2.8)                | (10.2)                | (11.1)                | (8.7)         |

The results of this analysis show that, generally, the conditions that used the Internet increased their online reading comprehension performance on the ORCA-IM more than the control group that did not use the Internet and did not receive strategy instruction in online reading comprehension. The control group started at the highest level during baseline, but ended



up at the lowest level of all three groups after 10 weeks. In addition, one can see that the High Intensity group achieved at the highest level after 10 weeks.

*ORCA-Blog Results.* During the project, we invested considerable time and energy to develop a second online assessment measure that had good psychometric properties and could be administered to all of the students at the end of the study with the resources we had. We managed to develop such an instrument: ORCA-Blog. We used this measure to evaluate changes in online reading comprehension performance by condition for all students in a post-test only design. This allowed us to answer the second part of our first research question:

*RQ1b: Do students who receive different intensity levels of Internet integration during science class perform better on a test of online reading comprehension compared to students who receive regular classroom instruction, without the Internet?*

Since students were not selected randomly to participate in this investigation, we could not assume that reading comprehension achievement scores did not vary by condition at the start. Thus, we tested ORCA-Blog scores by classroom condition using Analysis of Covariance (ANCOVA), with pretest reading comprehension scores on the DRP treated as the covariate. Online reading comprehension scores (ORCA-Blog) were entered as the dependent variable and classroom condition was tested as the independent variable. Results showed that traditional reading comprehension scores were not a significant covariate,  $F < .15$ ,  $p > .70$ , thus we trimmed the model by eliminating the covariate. We found a significant difference for online reading comprehension scores due to classroom condition,  $F(3, 84) = 5.02$ ,  $p < .003$ ,  $MSe = 52.22$ ,  $\text{partial } \eta^2 = .16$ . Post hoc comparison tests of means, i.e., Least Significant Difference (LSD), indicated that all online instruction groups were significantly different from regular classroom instruction ( $p < .003$ ). However, there were no significant differences among online instruction groups ( $p > .05$ ). Means and standard deviations are presented in Table 5.

Table 5.

*Online Reading Comprehension (ORCA-Blog) Means and Standard Deviations by Classroom Condition*

|      | Control | Low Intensity | Mod. Intensity | Hi Intensity | Total  |
|------|---------|---------------|----------------|--------------|--------|
| Mean | 7.71    | 15.21**       | 15.05**        | 14.70**      | 13.16* |
| S.D. | 8.51    | 7.05          | 7.68           | 7.95         | 7.95   |
| n    | 22      | 22            | 21             | 24           | 89     |

\*  $F(3, 84) = 5.02$ ,  $p < .003$

\*\*  $p < .003$  for each contrast with the control group.

In summary, Internet integration in a seventh grade science classroom resulted in higher achievement levels in online reading comprehension. This was true for both the ORCA-IM and ORCA-Blog; two assessment instruments with good psychometric properties. Each assessment required students to locate, evaluate, synthesize and communicate information on the Internet.

#### *Changes In Science Content Learning.*

Our second major area of investigation addressed changes in science learning outcomes as a result of different intensity levels of Internet integration:

*RQ2: Do students who receive different intensity levels of Internet integration during science class perform better on measures of science content learning?*

We evaluated the answer to this question with two separate analyses, one for each knowledge measure: declarative knowledge and conceptual knowledge.

*Declarative knowledge.* In the first analysis, declarative knowledge posttest scores were analyzed with classroom condition as the independent variable and pretest declarative knowledge scores as the covariate. We used a covariate analysis since random assignment of condition was done at the class level and we could not assure equivalence of declarative knowledge at the beginning of treatment.

ANCOVA results supported that pretest scores were a significant covariate,  $F(1, 79) = 263.42$ ,  $p < .0001$ ,  $MSe = 20.80$ ,  $\text{partial } \eta^2 = .77$ . After controlling for initial knowledge differences, classroom conditions were significantly different,  $F(3, 79) = 6.15$ ,  $p < .001$ ,  $MSe = 20.80$ ,  $\text{partial } \eta^2 = .19$ . Post hoc comparison results, using LSD procedures, demonstrated that students in the control condition outperformed students in all online instruction classes. Means, adjusted means, and standard deviations are presented in Table 6.

Table 6.

*Declarative Knowledge (Recognition Test), Adjusted Means, and Standard Deviations (S.D.) by Classroom Condition*

|                       | Control<br>n=22 | Low Intensity<br>n=22 | Mod. Intensity<br>n=21 | High Intensity<br>n=24 | Total<br>n=89   |
|-----------------------|-----------------|-----------------------|------------------------|------------------------|-----------------|
| Pretest Means (S.D.)  | 42.91<br>(8.23) | 44.19<br>(6.83)       | 43.14<br>(8.64)        | 38.86<br>(10.12)       | 42.24<br>(8.65) |
| Posttest Means (S.D.) | 58.64<br>(8.95) | 54.67<br>(8.16)       | 54.71<br>(10.57)       | 51.20<br>(9.94)        | 54.89<br>(9.63) |
| Adjusted Means        | 58.42           | 53.17**               | 54.26**                | 53.49**                | 54.84*          |

\*  $F(3, 79) = 6.15$ ,  $p < .001$

\*\*  $p < .015$  for each contrast with the control group.

*Conceptual knowledge.* In the second ANCOVA analysis, conceptual knowledge posttest scores were analyzed with classroom condition as the independent variable and pretest conceptual knowledge scores as the covariate. We used a covariate analysis since random assignment of condition was done at the class level and we could not assure equivalence of science knowledge at the beginning of treatment. Conceptual knowledge was operationalized by use of a concept map task.

ANCOVA results for the conceptual knowledge scores indicated that pretest performance was a significant covariate,  $F(1, 74) = 50.34$ ,  $p < .0001$ ,  $MSe = 397.80$ ,  $\text{partial } \eta^2 = .41$ . After controlling for initial conceptual knowledge differences, classroom conditions were significantly different at posttest,  $F(3, 74) = 4.87$ ,  $p < .004$ ,  $MSe = 397.80$ ,  $\text{partial } \eta^2 = .16$ . Post hoc comparison results showed that regular classroom instruction (control) and intensive integration

(online instruction with Internet Reciprocal Teaching for 12 weeks) were not different from one another. However, both of these groups outperformed the other two levels of online instruction classrooms (moderate intensity of Internet integration and low intensity of Internet integration). Means, adjusted means, and standard deviations are presented in Table 7.

Table 7.

*Conceptual Knowledge (Concept Map Test), Adjusted Means, and Standard Deviations (S.D.) by Classroom Condition*

|                | Control<br>n=22 | Low Intensity<br>n=22 | Mod. Intensity<br>n=21 | High Intensity<br>n=24 | Total<br>n=89 |
|----------------|-----------------|-----------------------|------------------------|------------------------|---------------|
| Pretest        |                 |                       |                        |                        |               |
| Means          | 19.16           | 18.10                 | 18.85                  | 14.23                  | 17.49         |
| (S.D.)         | (8.91)          | (5.17)                | (8.21)                 | (7.33)                 | (7.62)        |
| Posttest       |                 |                       |                        |                        |               |
| Means          | 116.62          | 96.53                 | 95.70                  | 102.90                 | 102.51        |
| (S.D.)         | (30.79)         | (17.37)               | (22.48)                | (30.53)                | (26.49)       |
| Adjusted Means | 113.61**        | 95.61                 | 93.15                  | 109.12**               | 102.87*       |

\*  $F(3, 74) = 4.87, p < .004$

\*\*  $P < .153$  for the contrasts with the control and high intensity conditions.

$P < .651$  for the contrasts with low intensity and moderate intensity conditions.

In summary, Internet integration in a seventh grade science classroom produced differential results in science learning, depending upon the type of knowledge that was measured. Internet integration resulted in lower achievement on simple declarative knowledge as measured on multiple-choice quizzes of factual information from a textbook. High intensity Internet integration resulted in conceptual knowledge in science learning on human body systems that was greater than either moderate or low intensity integration and equivalent conceptual knowledge learning with no Internet integration.

#### *Traditional Reading Comprehension Performance*

Our third major area of investigation evaluated relationships between traditional reading comprehension and: (1) online reading comprehension performance and (2) Internet integration in the classroom.

*Relationships between traditional reading comprehension and online reading comprehension performance.* New literacies theory (Leu, et al, 2004) would predict a marginal relationship, or possibly no relationship, between a measure of traditional reading comprehension and a measure of online reading comprehension. Reading on the Internet may require a somewhat different set of skills compared to those required to read a book. Students who do not know how to use a search engine, for example, may not be able to perform at high levels on the Internet, regardless of their ability to read a book or other traditional text. Thus, we framed our first question related to traditional reading comprehension in the following fashion:

*RQ3a: Is there a significant relationship between performance on an assessment of traditional reading comprehension and performance on an assessment of online reading comprehension?*

To evaluate this possibility, two-tailed Pearson Product Moment correlations were calculated using both the January and June DRP scores and each student's score on the ORCA-Blog assessment. Results indicate that neither the January nor the June score on the traditional reading assessment (DRP) was significantly associated with the online reading assessment (ORCA-Blog). The set of associations for all of the conditions appears in Table 8. One can see that the greatest associations appeared for the control condition, though these were not significant (Control and January DRP  $r = .406$ , two-tailed  $p = .065$ ). This may suggest that Internet access (Low Intensity Condition) and instruction in online reading comprehension strategies, as took place in the Moderate and High Intensity groups, may have mediated the association.

Table 8.

*Correlations [ $r$ ] between Traditional Reading Comprehension (DRP) and Online Reading Comprehension (ORCA-Blog) by Classroom Conditions*

|                | Control | Low Intensity | Mod. Intensity | Hi Intensity | Total |
|----------------|---------|---------------|----------------|--------------|-------|
| January<br>DRP | .406    | -.135         | -.128          | -.126        | .103* |
| June<br>DRP    | .306    | 0.65          | -.104          | -.115        | .105* |
| n              | 22      | 22            | 21             | 24           | 89    |

\* two-tailed  $p > .05$

*Relationships between traditional reading comprehension and Internet integration in the classroom.* Recent work in new literacies has hypothesized that instruction in the more challenging and higher level reasoning skills required on the Internet may impact traditional reading comprehension performance (Leu & Reinking, 2004). This possibility led to our final research question:

*RQ3b: Do students who receive different intensity levels of Internet integration during science class perform better on an assessment of traditional reading comprehension compared to students who receive regular classroom instruction, without the Internet?*

To determine whether students in the various classroom conditions differed with respect to their general reading comprehension scores, we calculated an ANCOVA treating January traditional reading comprehension (DRP) scores as a covariate, condition as an independent variable, and June traditional reading comprehension (DRP) scores as the dependent measure. ANCOVA results for the adjusted June traditional reading comprehension (DRP) scores indicated that the pretest DRP scores significantly covaried with posttest DRP scores,  $F(1, 80) = 189.10$ ,  $p < .0001$ ,  $MSe = 45.05$ , partial  $\eta^2 = .703$ , but there were no significant differences among the adjusted means for classroom condition,  $F(3, 74) < 1.03$ ,  $p > .38$ . Table 9 contains the mean scores on both the January and June administration of the traditional reading achievement measure (DRP) as well as the adjusted mean scores.

Table 9.

*Reading Comprehension Means, Adjusted Means, and Standard Deviations (S.D.) by Classroom Condition*

|                       | Control<br>n=22  | Low Intensity<br>n=22 | Mod. Intensity<br>n=21 | High Intensity<br>n=24 | Total<br>n=89    |
|-----------------------|------------------|-----------------------|------------------------|------------------------|------------------|
| Pretest Means (S.D.)  | 46.36<br>(14.91) | 47.57<br>(13.75)      | 55.71<br>(9.06)        | 51.65<br>(12.03)       | 50.31<br>(12.95) |
| Posttest Means (S.D.) | 51.76<br>(15.84) | 52.00<br>(11.99)      | 57.43<br>(6.59)        | 51.68<br>(12.64)       | 53.20<br>(12.26) |
| Adjusted Means        | 54.45            | 54.22                 | 53.00                  | 51.22                  | 53.24            |

In summary, consistent with new literacy predictions, we found no association between students' performance on either of the measures of traditional reading comprehension (January and June DRP) and their performance on the measure of online reading comprehension (ORCA-Blog). One association within the conditions between traditional and online reading comprehension approached significance in a two-tailed test. This occurred among the students in the control classroom, suggesting that this relationship may have been mitigated by the learning of online reading comprehension strategies and/or access to the Internet. Finally, there was no evidence that the three groups that received instruction in online reading comprehension strategies with Internet Reciprocal Teaching and/or had access to the Internet did better than the control condition on a test of traditional reading comprehension following treatment.

## DISCUSSION

The purpose of this study was to evaluate the effects of varying levels of intensity of Internet integration into seventh grade classroom science instruction. Intensity of integration was defined by the duration of Internet access as well as the duration of instruction in the new literacies of online reading comprehension. Four randomly assigned sections received different intensity levels of Internet integration during a twelve-week unit on human body systems. The control condition did not use the Internet in class and did not receive instruction in the new literacies of online reading comprehension. The low intensity group used the Internet in their class for seven weeks but did not receive instruction in online reading comprehension. The moderate intensity group used the Internet for twelve weeks and received seven weeks of Internet Reciprocal Teaching instruction to support the development of online reading comprehension skills. The high intensity group used the Internet for twelve weeks simultaneous with twelve weeks of Internet Reciprocal Teaching instruction in online reading comprehension.

*The Consequences of High-Intensity, Internet Integration*

High intensity integration, including both continuous Internet access from a classroom computer cart with 25 wireless laptops as well as daily Internet Reciprocal Teaching instruction in the new literacies of online reading comprehension, yielded two main results. First, high intensity integration produced learning of conceptual knowledge in human body systems that equaled that of the control group, a condition that only used a textbook and other printed materials. This significantly exceeded that of the other treatment conditions. Second, high intensity integration resulted in greater ability to read, comprehend, and communicate online, compared to the control group.

A common concern of content area teachers, especially at the middle and secondary school level, is that content instruction that also integrates reading and writing instruction will take important time away from content area learning (Vacca & Vacca, 2004) and impede content learning. A similar concern has been found with Internet integration; teachers often express the concern that Internet integration takes up time at the expense of content learning (Leu, 2002). We do not seek to minimizing the important role that professional development plays in supporting Internet use in the classroom. We are convinced, from other work (Branigan, 2002; Coiro, 2005b), that this is essential for any change to happen. Having said this, the data in this study suggest that concerns by some content area teachers that the Internet and online reading comprehension strategy instruction will impede content learning are unfounded. Concerns that content learning may suffer because the Internet takes students away from targeted concepts appear less problematic than expected.

High-intensity Internet integration produced conceptual learning gains that were equivalent to students who used textbooks and other printed materials. In addition, however, high-intensity Internet integration also produced significantly greater gains in online reading comprehension compared to control students. It is possible that this increased ability to read, write, and communicate online will lead to greater learning gains over time and in other content areas, possibilities that were not evaluated in the present study.

An interesting finding of this study was that gains in online reading comprehension seemed not to depend on the amount of Internet Reciprocal Teaching instruction. High-intensity, moderate-intensity, and low- intensity conditions all produced the same gains in online reading comprehension over the control group. These similar gains, regardless of intensity, may result from the new literacies of online reading comprehension being quickly acquired by adolescents through socially constructed processes as they engage with the Internet in classroom learning. Students may not require the more formal learning typical of content area instruction to develop online reading comprehension skills but do require it to fully integrate conceptual learning in content areas with the new literacies of the Internet. Only high-intensity integration generated the gains in conceptual science knowledge achieved by the control group, along with the gains in online reading comprehension achieved by the other groups who used the Internet.

During classroom Internet Reciprocal Teaching instruction, we sought opportunities to have lesser skilled readers acquire online reading comprehension skills first and then become the experts who taught higher achieving readers. Perhaps this strategy of fostering the deeper conceptual learning gains along with greater online reading comprehension achievement enabled these lesser skilled readers to make greater gains in online comprehension skills compared to their more skilled reading peers.

The finding that all Internet groups gained equally in terms of online reading comprehension achievement was somewhat surprising, given the strong and consistent effects found in studies of

Reciprocal Teaching. A meta-analysis of Reciprocal Teaching studies (Rosenshine & Meister, 1994) found that this instructional model regularly produced substantial effect sizes, .32 when standardized tests were used to assess comprehension, and .88 when experimenter-developed comprehension tests were used. Two factors may have accounted for the fact that similar effects were not found in this study. First, all of the studies of Reciprocal Teaching took place within more intensive small group settings. This was not attempted in these content classes. We adapted the Reciprocal Teaching model for use in the whole class setting that defined instruction in these classes. Future adaptations of Reciprocal Teaching for teaching online comprehension skills should include more intensive small group instruction.

Another interesting finding was that simple declarative knowledge was negatively influenced by Internet Reciprocal Teaching instruction with Internet integration. The control class (no Internet integration and no Internet Reciprocal Teaching instruction) gained significantly more on the measure of simple declarative knowledge, compared to the three treatment conditions that integrated the Internet into classroom lessons. Thus, if the goal of science instruction is simple mastery of factual content, the Internet may be unnecessary. If, however, the goal of science instruction is to foster the development of deeper conceptual knowledge as well as an understanding of relationships between scientific concepts, intensive Internet Reciprocal Teaching instruction with Internet integration appears to produce equal levels of achievement compared to traditional classroom instruction while also generating gains in online reading comprehension.

It is important to note that low- and moderate-intensity integration resulted in lower conceptual learning than high-intensity integration. This suggests that the integration of Internet use may need to be both sustained over longer periods and paired with Internet Reciprocal Teaching instruction in order to achieve the same level of conceptual learning in science as a control class taught by an outstanding science educator. Partial implementation of Internet integration, as is typical in most classrooms, may in fact decrease science concept learning. It may be better to fully integrate the Internet with continuous *and* consistent access along with consistent online reading comprehension strategy instruction or not integrate the Internet at all. Such a conclusion suggests that ubiquitous Internet access is an essential imperative for learning, of which curriculum developers and public policy makers could take greater note. Our data indicates, however, that the power of such an imperative lay in the combination of ubiquitous access *and* systematic instruction in online reading comprehension strategies using Internet Reciprocal Teaching.

### *Measuring the New Literacies of Online Reading Comprehension*

A major result of this work is that we refined two important measures of online reading comprehension with strong psychometric properties. Both ORCA-IM and ORCA-Blog demonstrated strong construct validity, being aligned with the central aspects of online reading comprehension theory. Each required students to locate, critically evaluate, synthesize, and communicate content area information using online resources such as search engines, blogs, or instant messaging. In addition, both demonstrated strong internal psychometric properties with good internal consistency and test-retest reliability. Thus, both may provide researchers with a useful tool in the important work that lies ahead. The quick scoring procedure established for ORCA-Blog makes this a bit easier since it only requires one adult to observe and score and may be done while the student is completing the task. Thus, with additional refinement, ORCA-Blog may become a good candidate for use by educators.

The development of new assessment tools to measure online reading comprehension is not a trivial matter (IRA, 2001; RAND Reading Study Group, 2002). The reading community has largely failed to recognize the need to look closely at the changes to reading that take place on the Internet (Leu et al., 2004). Recent policy initiatives have focused attention on the need to increase reading achievement test scores for all children and are to be commended for the importance of that goal. However, since state assessments only test students' ability to read within traditional text environments (Leu, Ataya, & Coiro, 2002), reading instruction has focused on traditional reading skills at the expense of online reading skills. Recent work (Coiro, 2003; Coiro & Schmar-Dobler, 2005; ETS, 2004; Henry, in press; Lankshear & Knobel, 2003; Leu & Reinking, 2004; Leu & Hartman, 2005) suggests that traditional reading skills may differ in important ways from the reading skills required for the twenty-first century when much of our reading will take place within informational networks (U.S. Department of Commerce, 2002).

In this study, the finding that performance in online reading comprehension with ORCA-Blog did not correlate with performance on one of the more common measures used for state assessments (DRP) is important, and especially unusual. DRP test scores are highly inter-correlated (Harris & Sipay, 1990). It is most unusual to find a measure of reading comprehension that has strong psychometric properties and construct validity but does not correlate with performance on another measure that also has these properties. This result may be due to the fact that online reading comprehension skills are substantially different from traditional text reading skills and that ORCA-Blog and the DRP measure complimentary, but orthogonal skill sets. Such an interpretation provides important support for arguments that online reading comprehension requires similar, but more complex skills compared to the comprehension of traditional text (Coiro, 2003; Coiro & Schmar-Dobler, 2005). Coiro & Schmar-Dobler (2005) provide qualitative data to show how prior knowledge use, inferential reasoning, and comprehension monitoring require new sets of skills during online reading comprehension. Online readers must construct not only internal constructions of the text they read, but also unique, external texts through the links that they choose to follow in a process of self-directed text construction. Since online readers are engaged in two constructive processes simultaneously, online reading comprehension becomes, by definition, more complex. This may account for the lack of association that we found between ORCA-Blog and the DRP.

Alternatively, the lack of correlation may be due to the fact that the DRP, because it uses a cloze procedure task, does not require the higher level thinking skills required on the Internet. But given the high inter-correlation among reading comprehension measures, it is difficult to dismiss this finding solely on the basis of a task difference. Thus, it is important to follow up this finding with a comparison with a wider range of reading comprehension assessments.

Finally, this study did not find evidence that groups who received Internet Reciprocal Teaching and/or had access to the Internet performed better than the control condition on a test of traditional reading comprehension following treatment. We did not find support for the recent hypothesis (Leu & Reinking, 2004) that instruction in the higher-level comprehension skills required on the Internet would generate increased gains in traditional reading comprehension. It may be useful to pursue this question a bit further, though, with comprehension assessments that require critical thinking and other higher level skills more directly than the DRP. Additionally, it may be too optimistic to think that these skills will transfer after only 12 weeks of instruction.



## SUMMARY

As online learning opportunities become increasingly available to teachers of adolescents in schools, it becomes important to understand how best to support the development of online reading comprehension skills. How should we measure online reading comprehension? How should we teach online reading comprehension skills within content area instruction in ways that allow us to achieve the conceptual understandings that we seek? This study helps us to think in new ways about online learning. In sum, this study's data indicates that online reading comprehension of sufficient intensity not only improves online reading skills, but also sustains important learning of conceptual content information.

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## APPENDICES

- Appendix A Internet Reciprocal Teaching Skills and Strategies
- Appendix B Human Body Project Descriptions and Assessment Rubrics
- Appendix C Timeline of Human Body Units Taught and Assessments Administered
- Appendix D Worksheets Completed in the Control Classroom
- Appendix E Online Reading Comprehension Protocols and Assessment Rubrics
- Appendix F Inter-Rater Reliability Comparisons – ORCA- Blog
- Appendix G Human Body System Quizzes
- Appendix H Annotated Examples of Concept Map Scoring

## **SEARCH AND LOCATE**

Copying and pasting URL into new browser windows  
Clicking on a URL in an IM message to open the site  
Skimming and scanning webpages to locate specific information quickly  
Attending to text features on a webpage (headings , subheadings, buttons, and links) to aid in skimming, scanning and locating information  
Using keyword strategies to locate specific information (not broad categories of info)  
Reading and interpreting search engine results  
Knowing when to skim and when to read carefully  
Knowing how to go back to a site you may have exited from too soon  
Navigating using the back button  
Knowing how to use any site' s menu bars or indexing system  
Searching within a site (edit find or search within site tool)  
Opening an email attachment  
Accessing a hyperlink from a document (double click, cut and paste, or right click)  
Knowing when a file links to URL and when it links to a PDF (downloaded on to hard drive)

## **CRITICALLY EVALUATE**

Skimming and scanning webpages to locate specific information quickly  
Reading and understanding informational text as presented on a webpage  
Knowing when to skim and when to read carefully  
Knowing when to go back to a site you may have exited from too soon  
Reading and understanding directions before acting (reading, thinking, developing  
Examining sites in response to a purpose  
a plan)

## **SYNTHESIZE**

Copying an pasting text from one place to another (between windows)  
Reading and understanding informational text as presented on a webpage  
Reading and understanding directions before acting (reading, thinking, developing a plan)  
Finding information from multiple places and using it to explain, compare or contrast facts  
Using prior knowledge as a guide - not overusing it as the answer

## **COMMUNICATE**

Copying and pasting URL into IM messages and into emails to “share sites”

- Clicking on a URL in an IM message to open the site
- Copying and pasting text from one place to another (between windows)
- Opening an email attachment
- Sending an email attachment
- Knowing when to reply to a message and when to start a new message
- Constructing a message that includes a greeting, body, and closing (as appropriate to purpose)
- Knowing how graphics may (or may not) support informational text

### **SELF REGULATION**

- Not being distracted by information you're interested in but not looking for

### **OTHER**

- Knowing how to close pop-up ads
- Knowing how to respond to computer commands in pop-up windows (security alerts, remember this password?, save before closing, etc.)

### **Strategies to teach in IRT**

- Using communication tools to share resources outside of class (email, blogs)
- How to send and receive email attachments,
- How to cut and paste URL's to share information.
- How to click on a URL to get to a site (in email or IM).
- Using edit find command to aid in skimming and scanning on a site for specific information
- Share different search engines and demonstrate how each are different
- Brainstorm possible key words for searching (various topics)
- Trying different searching to closely examine the difference in the results
- Demonstration and guided practice of Boolean search strings ( + " " and or not)
- Reading and interpreting search engine results.
- guidance in how to read the list of results, what to look for.
- Discuss how carefully reading the descriptions below each link (for different purposes)
- Discuss what a reputable source is and how to determine where it came from.
- Examine the different suffixes (.org, .com, .edu, .net) and what they mean.

## Appendix B

### *Human Body Projects*

#### *Circulatory System Project*

This contest will involve using your ingenuity, creativity, artistic talent and research skills. Each group will design an informational brochure about the circulatory system. The winning brochure will be copied for our entire class to use as a study guide and reference for our writing assessment on the circulatory system. It will also be sent to Department of Public Health as a way to promote awareness of how the body works.

#### **Each brochure should contain the following components:**

1. **Core information:** Show and describe how the circulatory system works when it is healthy. Include important organs and their primary function.
2. **Theme:** Each brochure will have a specific message you want to communicate. Choose one of the following themes to explore.
  - a. **Circulation and heart trivia:** share amazing facts that make us think.
  - b. **Mysteries of the heart:** explore what still puzzles scientists about the heart and how it works.
  - c. **Donation and transplantation:** discover how organ transplantation and blood transfusions save lives.
  - d. **Heart disease:** choose a disease, explore the causes, and share ways to prevent problems.
  - e. **Circulation and keeping fit:** share the role regular exercise plays in keeping the heart healthy.
  - f. **Propose a theme of your own:** run your idea by me to see if it's a good match with the project's goals.
3. **References:** Explore as many resources as you can in order to gather the most useful and accurate information possible. You will need to work together to pool the information you find and make decisions about what to include in the brochure. Make a list of all the sources used and include a reference list.

You will be given time in class to complete this project. You will also need to work outside of class to gather resources, write drafts of sections, collect graphics/images, and layout the final product.

You will be in charge of determining homework assignments necessary to complete the project on time. Your group will need to adhere to the project timelines and work cooperatively to make your final product the best it can be.

To assist your group, a contract has been drafted that each group member will sign. This contract signifies a commitment on each group member's part to complete the assigned work and willingness to exchange ideas and opinions cooperatively with others. All group members will play a roll in the success of this project.



## Appendix B

### *Human Body Projects*

#### **Objectives :**

1. Students will work in collaborative teams to discuss, exchange, and share information about the circulatory system's anatomy and physiology.
  - a. Students will describe the function of the circulatory system.
  - b. Students will describe the structure and function of the heart.
  - c. Students will trace the path blood takes as it moves through the body.
  - d. Students will describe the function of arteries, capillaries, and veins.
  - a. Students will identify common heart diseases, their causes, and how to prevent them.
2. Students will collect data from a variety of resources. These resources will be shared and discussed with the group for the purpose of:
  - a. Determining which resources are most reliable.
  - b. Collecting evidence from multiple sources.
  - c. Comparing and contrasting information found.
  - d. Synthesizing information.
3. Students will decide on how to best synthesize the information and how to organizing the information utilizing text features common to brochures.
4. Students will demonstrate the ability to evaluate their own and others work objectively through the use of a rubric with specified evaluation criteria.

#### **Process:**

- At the start of each period, the teacher will gather the class together for a pertinent mini-lesson on procedures for completing the project. These lessons will include discussion of objectives, project logistics, resource exploration, timelines, and evaluation criteria. These mini-lessons will last approximately 10 minutes in each condition per day.
- The mini-lesson will be followed by a work period lasting 25 minutes. During this time group members will discuss strategies for completing the project (brainstorming, research, discussion, etc.) Students will bring information resources to the group, share what they've learned and to cooperatively work to meet the deadlines. Each student will have a defined role they will play in the group but will also assist others.
- Each period will end with a wrap-up of the day, homework reminder (the groups will decide these tasks for themselves with teacher guidance when needed) and the exit slip with engagement ratings.
- The IRT group will have an additional 10-15 minute mini-lesson each day. These mini-lessons will be based on strategies for using the Internet. The IRT group will have less group meeting time, but more instructional guidance. They will be taught the strategies for exchanging information online, and will be expected to use these skills to exchange information via e-mail.
- During the course of the work period, the teacher will rotate through each of the groups, to support their work as needed.
- The team members will be encouraged to communicate often about what's needed and who will bring what back to the group for discussion (offline will exchange phone numbers and study hall times, online groups will exchange emails).
- The teacher will keep track of each team's progress by monitoring email or blog posts in online groups and through oral progress reports in the offline project group. The teacher will provide target dates for having various parts of the project completed and a contract to keep everyone accountable for their part.

Appendix B  
*Human Body System*

*Circulatory System Project Rubric*

|   | 2  | 3  | 4   | 5   |
|---|--|--|---|---|
| <b>Content - Information and Accuracy</b> | There are too few facts included to determine students' knowledge of the anatomy and physiology of the circulatory system. Some misinformation may have been included. | Some information is accurate but much of the information is not relevant to the topic. Project demonstrates minimal content knowledge of the anatomy and physiology of the circulatory system. | Most information is accurate but some ideas are not relevant to the topic. Project shows a surface understanding of the anatomy and physiology of the circulatory system. | Information presented is accurate, factual, and relevant to the topic. Project shows an in-depth understanding of the anatomy and physiology of the circulatory system. |
| <b>Research</b>                           | Research may have occurred but it is not evident in the final product that this was thorough process.  | Very little research is evident. Only a few resources were examined and referenced.  | Research is evident, but references are not extensive. Project demonstrates a surface examination of resources.   | Research is in-depth and demonstrates a thorough and extensive examination of resources.  |
| <b>Attractiveness &amp; Organization</b>  | The brochure's formatting and organization of material are confusing to the reader.  | The brochure has well-organized information.   | The brochure has attractive formatting and well-organized information.  | The brochure has exceptionally attractive formatting and well-organized information.  |
| <b>References</b>                         | References were not documented.  | Records were not well kept. Documentation of resources was incomplete or inaccurate.   | Records were kept to document some of the facts and graphics in the brochure.   | Careful and accurate records were kept to document the source all of the facts and graphics in the brochure.  |
| <b>Graphics/Images</b>                    | Graphics do not go with the accompanying text or appear to be randomly chosen.   | Graphics go well with the text, but there are so many that they distract from the text.  | Graphics go well with the text, but there are too few and the brochure seems "text-heavy".  | Graphics go well with the text and there is a good mix of text and graphics.  |
| <b>Writing - Vocabulary</b>               | The amount of content specific vocabulary used was minimal.  | An attempt to use content specific vocabulary was made, but these words were incorrectly used.   | A few content specific vocabulary words were included and used properly.  | Several content specific words were properly used in ways that enriched the reader's understanding.   |

## Appendix B

### *Human Body Projects*

#### ***Respiratory System Project***

##### **Layout**

1. Use bold subheadings to organize the information in each section.
2. Include a complete list of references on the back of the poster.
  - a. If you used a book: Title of Book and page number(s).
  - b. If you used an encyclopedia: Title, year, topic, and page number(s).
  - c. If you used an article: Author, title of article, journal, page number(s).
  - d. If you used a website: Title of Site and URL.
  - e. If you used an image: Title of Book or Site and page number or URL.
3. Consult more than one resource when researching your scientist.
4. Make sure the size paper or poster board used provides enough space to layout the information you have collected in a neat and organized way.

##### **Basic Requirements – Report ALL of the following information:**

1. The first and last name of your scientist.
2. **ONE-TWO** sentences explaining why your respiratory scientist is famous.
3. The date and state and city he/she of his/her birth.
4. **TWO –THREE** sentences describing historical trends when your scientist completed his/her work.
5. **One well developed paragraph** describing your scientist's accomplishments (written in your own words).
6. Explain in **2-3 sentences** describing how your respiratory scientist's accomplishments impacted the field of science.
7. Include date of death or current age if living today.

##### **Choose TWO of the following requirements to add to your poster (AFTER the above information has been completed):**

1. A quote by your scientist.
2. Other discoveries your scientist's work led to.
3. What motivated your scientist to do his/her work.
4. Other scientists yours worked with and work they completed together.
5. A picture of your scientist.
6. A graphic or clip art symbolizing your scientist's work.

**Many inventors and scientists have made an important contribution to our current knowledge of the respiratory system (you are not limited to one of these scientists, these are suggestions).**

|   |  |
|---|--|
| John Gibbon (heart/lung bypass machine)             | Inventor of tracheotomy equipment/procedure  |
| Forest Bird (respirator)                            | Inventor of the aqua lung                    |
| Rufus Stokes (air purification device)              | Medical doctors researching asthma treatment |
| Henry Heimlich (oxygen delivery, Heimlich maneuver) | Any groundbreaking Pulmonologist             |
| Phillip Drinker (iron lung)                         | Researchers studying SARS                    |
| Albert Calmette (treatment of tuberculosis)         | Inventor of the oxygen mask                  |
| John Scott Haldane (respiratory physiologist)       | Pioneers in lung transplantation             |

## Appendix B

### Human Body Projects

#### Respiratory System Project Rubric

|  |          |          |          |          |          |
|--|----------|----------|----------|----------|----------|
| <b><u>Accuracy and completeness:</u></b>   | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Information provided is correct,<br>Sentences are easy to read, logical, and informative.                                |          |          |          |          |          |
| <b><u>Spelling, grammar and complete sentences:</u></b>  | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| No errors in spelling, grammar is correct, and<br>Information was written in student's own words.                        |          |          |          |          |          |
| <b><u>Overall presentation, neatness, and creativity:</u></b>  | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Poster shows effort, neatness, and creativity;<br>Information was typed or hand written in pen/marker.                   |          |          |          |          |          |
| <b><u>Project was turned in on time</u></b>  | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Time in class was productive.<br>Student made good use of class time to research and collect information from resources. |          |          |          |          |          |

#### **Requirements**

|  |   |   |   |   |   |
|--|---|---|---|---|---|
| Explanation of why your scientist is famous                        | 0 | 1 | 2 | 4 | 5 |
| Date of birth and place of birth                                   | 0 | 1 | 2 | 4 | 5 |
| Historical trends during the time of this scientist's work         | 0 | 1 | 2 | 4 | 5 |
| Overview of this scientist's accomplishments                       | 0 | 1 | 2 | 4 | 5 |
| How your scientist's accomplishments changed the field of science. | 0 | 1 | 2 | 4 | 5 |
| Accuracy of date of death or current age if living today           | 0 | 1 | 2 | 4 | 5 |

#### **Two of the following additional items**

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| Quote   | 0 | 1 | 2 | 4 | 5 |
| Other discoveries your scientists work led to                   | 0 | 1 | 2 | 4 | 5 |
| What motivated your scientist to do his/her work                | 0 | 1 | 2 | 4 | 5 |
| Other scientists worked with and overview of collaborative work | 0 | 1 | 2 | 4 | 5 |
| Pictures of scientist   | 0 | 1 | 2 | 4 | 5 |
| Graphics to symbolize the scientist's work                      | 0 | 1 | 2 | 4 | 5 |

Total points:                      /60

Appendix B  
*Human Body Projects*

*Digestive System Project*

**Task:** Create a PowerPoint slide show focused on a digestive topic. These will be shared with other classmates to learn about the digestive system.

**Step 1:** Choose a topic that is of interest to you from the list below.

**Step 2:** Decide if you will work with one partner or by yourself.

**Step 3:** Locate the section in your textbook that gives you information about your topic.

**Step 4:** Locate 2-3 websites that provide information about your SPECIFIC topic. You must find and use only the BEST resources on the web.

**Discussion:** Is this the **best** resource to help me learn this information?

Who created this site and for what purpose?

How do I know this information is accurate?

**Step 5:** Carefully read your resources together. While reading, summarize the key ideas orally as you go.

**Discussion:** Take turns summarizing and clarifying WHILE reading

**Step 6:** Using what you have learned, create 4-6 PowerPoint slides that summarize the key ideas. Use bullet points, but provide information that FULLY explains your topic. NO CUTTING AND PASTING from these sites will be allowed. Use ideas from the discussions you had.

**Step 7:** Create a slide with 3 quiz questions that test understanding of the information you presented.

**Assignment objectives** (these match DIRECTLY with what's on the QUIZ):

- What are the primary digestive organs? Where are they located?
- What are the secondary digestive organs? Where are they located?
- What is mechanical digestion? What is chemical digestion?
- How and why does the body break down food and digest it?
- What are the important digestive functions?

Appendix B  
*Human Body Projects*

**Topics for Slide Presentation**

1. Explain the muscle actions in your digestive organs
2. Tell about digestive juices, acids and enzymes
3. What does bile do, where is it made and what is its function
4. Name, locate, and describe the primary digestive organs
5. Name, locate, and describe the secondary digestive organs
6. Describe the path food takes through the digestive system and what happens along the way.
7. Explain why the digestive system is important, what its purpose is and how it works with other body systems – give examples
8. Explain what happens in the small intestine and large intestine
9. Explain in detail what happens in the stomach
10. Explain the differences between chemical and mechanical digestion
11. Explain the role does saliva plays in digestion and how/why do we have so much of it
12. Explore your “guts” from the inside, what makes them work?
13. What is absorption, what is being absorbed and where does this occur?

Digestive System Project Rubric

# **DIGESTIVE POWERPOINT PROJECT**

## ***GRADING SHEET***

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| Project adheres to the 4-8 slide minimum and maximum  | 1 | 2 | 3 | 4 |   |
| Project contains a hyperlink(that works) to an interactive Picture/website                                  | 1 | 2 | 3 | 4 |   |
| The powerpoint is organized well and easy to follow   | 1 | 2 | 3 | 4 |   |
| The powerpoint text is written in bullets   | 1 | 2 | 3 | 4 |   |
| The content contained is accurate and relevant To the specific topic  | 1 | 2 | 3 | 4 |   |
| The content is written in the students own words  | 0 | 2 | 4 | 6 | 8 |
| The powerpoint contains a four question quiz About the topic and the presenters accurately Know the answers | 1 | 2 | 3 | 4 |   |
| The entire project is turned in on time   | 1 | 2 | 3 | 4 |   |
| The project contains at least one appropriate picture   | 1 | 2 | 3 | 4 |   |

Appendix B  
*Human Body Projects*

*Cardiovascular System Project*

*Cardiovascular mapping*

The **cardiovascular system** is your body's transport and delivery system. It's made up of the **heart, blood, blood vessels, and respiratory organs**. It keeps blood moving through the heart, lungs and around the body. It allows for the delivery of oxygen and nutrients to every cell. It also picks up waste products so that your body can get rid of them.

Objectives:

- ❖ Create a flowchart that maps the path an oxygen molecule takes as it moves throughout the body.
- ❖ Use the flowchart to explain cardiovascular processes.

Step 1:

- ❖ View **Normal Breathing Gas Exchange** *two times all the way through* <http://www.airinfnow.org/html/lungattack/lungplay.htm> Read and make notes as you go.

Step 2:

- ❖ Examine **Blood Around the Body** *two times all the way through* <http://www.educationusingpowerpoint.org.uk/Animations/blood%20around%20body.html> Follow the molecule as it enters the bloodstream and is transported around the body. Read and make notes as you go.

Step 3:

- ❖ View **The Cardiac Cycle** *two times all the way through* <http://www.activescience-gsk.com/miniweb/content/heart/cardiac.cfm>
- ❖ View **Cardiovascular System Basic Structure** *two times all the way through* <http://www.biologyinmotion.com/cardio/>
- ❖ As you read and view these two sites, examine how the circulatory and respiratory systems work together. Read and make notes as you explore the sites.

Step 4:

- ❖ On the back of this worksheet, draw a **flow chart** to show steps in the process of **transport** throughout the body.



Appendix B  
*Human Body Projects*

*Cardiovascular System Project*

*Cardiovascular word sort*

The **cardiovascular system** is your body's transport and delivery system. In order for the cardiovascular system to be strong and stay healthy, a person must exercise regularly, avoid exposure to pollution, and seek treatment for conditions such as asthma.

Objectives:

- ❖ Explore simulations to examine cause and effect relationships in cardiovascular health.
- ❖ Work cooperatively to sort vocabulary words associated with cardiovascular health.
- ❖ Explain the associations between terms for cardiovascular processes.

Step 1: Choose one of the following topics to explore in today's simulations:

1. The effects of **exercise** on breathing rate and heart rate.
2. The effects of **pollution** on the respiratory and circulatory systems.
3. The effects of **asthma** on the respiratory and circulatory systems.

Step 2: Explore the simulations and readings that go with your topic choice, making notes as you go.  
Discuss the cause and effect relationships described.  
List scientific terms that help explain the concepts.

Exercise:

- ❖ Aerobics for Heart <http://www.new-fitness.com/Aerobics/heart.html>
- ❖ The Effects of Exercise  
<http://www.biologymad.com/master.html?http://www.biologymad.com/HeartExercise/HeartExercise.htm>
- ❖ How Your Body Uses Oxygen <http://devweb3.vip.ohio-state.edu/Materials/PDFDocs/health-p/how-body-oxygen.pdf>

Pollution:

- ❖ The effects of pollution on the lungs (4 video segments)  
<http://www.airinonow.org/html/lungattack/lungplay.htm>
- ❖ Air pollution effects  
[http://library.thinkquest.org/26026/Environmental\\_Problems/air\\_pollution\\_-\\_effects.html](http://library.thinkquest.org/26026/Environmental_Problems/air_pollution_-_effects.html)
- ❖ Health Pollution linked to heart disease  
<http://news.bbc.co.uk/1/hi/health/149716.stm>

Appendix B  
*Human Body Projects*

**Asthma:**

- ❖ What is asthma? <http://www.whatsasthma.org/flash/hasthmav.html>
- ❖ Asthma  
<http://flash.illustratedideas.com/iicatalog/animation/med/fam/asthma/shell.swf>
- ❖ Surviving Asthma <http://survivingasthma.com/asthmaandheart.htm>

**Step 3:** Gather the vocabulary cards and poster boards.  
Arrange the vocabulary terms into lists showing relationships.  
Create a title for each list using a blank label.  
Once the lists are finalized, affix the lists to the boards.

**Step 4:** Explain the relationships between the vocabulary terms by writing a 2-3 sentence explanation for each list. Make sure each list has a title that explains the relationship between the words you grouped together.

Be sure you and your partner have fully explored the online resources before beginning.

Work as a team, your discussions will determine how much you understand and can explain and will ultimately improve your understanding.

Appendix B  
*Human Body Projects*

*Cardiovascular System Project*

*Cardiovascular essay*

Using the resources you created (the flowchart, the vocabulary map, and any notes you may have taken), **write an essay to explain why you feel the cardiovascular system is the most important system in the body.** You may use diagrams in your explanation to help you to explain your thinking.

In your essay, be **sure** to include:

- how the body's cardiovascular system works
- what cardiovascular processes the body carries out and why are they important
- specific ways the circulatory and respiratory systems work together
- how cardiovascular processes keep a healthy body functioning

You may also **want** to include:

- ways to improve cardiovascular health
- the harmful effects pollution or disease has on the body
- ways to avoid exposure to pollution
- how to treat certain diseases so that the body can remain healthy

## Appendix B

### Human Body Projects

*Cardiovascular System Project Rubric*

| Criteria                 | 1   | 2  | 3   | 4  | 5  |
|--------------------------|---|--|---|--|--|
| Conceptual Understanding | Includes too few details to determine conceptual understanding of cardiovascular processes.   | Information included about cardiovascular processes is inaccurate.   | Demonstrates general understanding of cardiovascular processes but no specifics are provided for either blood flow or oxygen delivery.                        | Demonstrates understanding of gas exchange but includes limited information on blood flow and oxygen delivery.                     | Demonstrates understanding of blood flow and gas exchange. Includes how and when the blood cells pick up and deliver oxygen. |
| Synthesis                | Includes too few details are included. Unable to determine if the student has made connections between the circulatory and respiratory processes. | Respiratory and circulatory processes are connected but inaccurately.  | Respiratory OR circulatory processes are referred to but references to one or the other are absent. A few general connections are made that lack specificity. | Respiratory and circulatory processes are referred to generally, with some connections made.                                       | Respiratory and circulatory processes are explicitly interconnected with specific examples                                   |
| Vocabulary               | The amount of content specific vocabulary used was minimal.   | An attempt to use content specific vocabulary was made, but these words were incorrectly used.                     | A few content specific vocabulary words were included; some were used accurately, although others were not.   | Several content words were used that explained the topic generally.  | A wide array of content specific words was used in ways that clearly explained explicit content connections.                 |
| Accuracy                 | Includes too few details to determine accuracy or anatomy or physiology.  | Information included is not scientifically accurate. Misconceptions of human anatomy and physiology are prevalent. | Some information included is scientifically accurate. Reflects some misconceptions of human anatomy and physiology.   | The majority of information included is scientifically accurate. Reflects a general understanding of human anatomy and physiology. | All information included is scientifically accurate. Reflects a strong knowledge of human anatomy and physiology.            |

Appendix B  
*Human Body Projects*

*Integrated Body Systems Project*

Using the scientific method, and data from the patient's attached chart, diagnose the mystery medical condition. Follow the clues to arrive at a reasonable solution.

**Step 1 Ask Questions**

- ✓ Determine what information on the chart is most relevant.

**Step 2 State Your Hypothesis**

- ✓ What could be the cause of the patient's problem?
- ✓ Be sure to justify HOW you arrived at your hypothesis.

**Step 3 Design a Research Plan**

- ✓ What steps will you take to find the cause of the patient's problem?
- ✓ Write the steps you will take to examine the symptoms, research the disease, find the cause

**Step 4 Collect Data**

- ✓ Find and examine resources that support your hypothesis.
- ✓ Based on what you learn during data collection, you may need to reject your original hypothesis, form a new one, and repeat steps 1-3.

**Step 5 Analyze Data**

- ✓ Form a conclusion that links the patient and the disease.
- ✓ Provide reasonable supporting evidence.

Discuss and document your ideas and opinions during each step of the process. These notes will be useful to show that you ruled out other possible causes for the patient's symptoms.

Integrated Body-Systems Project Rubric

# **MEDICAL MYSTERIES**

## **Oral Report Grading Sheet**

|  |          |          |          |          |
|--|----------|----------|----------|----------|
| <b>-Students are prepared to present on time</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|--|----------|----------|----------|----------|

|   |          |          |          |          |
|---|----------|----------|----------|----------|
| <b>-Students turn in a completed packet That demonstrates use of the Scientific method to solve the mystery</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|---|----------|----------|----------|----------|

|   |          |          |          |          |
|---|----------|----------|----------|----------|
| <b>- Both students speak in a manner in which the audience can understand</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|---|----------|----------|----------|----------|

|  |          |          |          |          |
|--|----------|----------|----------|----------|
| <b>-Both students make eye contact with the audience</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|--|----------|----------|----------|----------|

### **The Oral Report Contains the Following Information**

|   |          |          |          |          |
|---|----------|----------|----------|----------|
| <b>- An explanation of what is wrong with with your patient</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|---|----------|----------|----------|----------|

|  |          |          |          |          |
|--|----------|----------|----------|----------|
| <b>-Facts and evidence that support your conclusion.</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|--|----------|----------|----------|----------|

|  |          |          |          |          |
|--|----------|----------|----------|----------|
| <b>- Did your hypothesis change? If so how did it change as you gathered information</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|--|----------|----------|----------|----------|

|   |          |          |          |          |
|---|----------|----------|----------|----------|
| <b>-Explain how your patients disease affects his/her circulatory, respiratory and digestive systems.</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|---|----------|----------|----------|----------|

|   |          |          |          |          |
|---|----------|----------|----------|----------|
| <b>-A visual that enhances the oral presentation, and is easily visible to the audience</b> | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|---|----------|----------|----------|----------|

|                  |               |            |
|------------------|---------------|------------|
| <b>Comments:</b> | <b>Total:</b> | <b>/36</b> |
|------------------|---------------|------------|

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## Appendix C

### *Timeline of Human Body Units Taught and Assessments Administered*

#### February 2005

| Mon  | Tues   | Weds   | Thurs  | Fri   |
|--|--|--|--|---|
|  | 1<br>Consent Forms<br>100% return rate                 | 2<br>Introductory<br>Lesson for<br>Laptop handling<br>etc. | 3  | 4<br>Pre DRP<br>assessment of<br>Reading<br>Comprehension |
| 7  | 8  | 9  | 10   | 11  |
| 14<br>Pre Concept Map<br>& Essay<br>Integrated Body<br>Systems           | 15<br>Pretest admin of<br>online task<br>(11 students) | 16<br>Pretest admin of<br>online task<br>(11 students)     | 17<br>Pretest admin of<br>online task<br>(11 students) | 18<br>Pretest admin of<br>online task<br>(11 students)    |
| <b>February Recess – No School</b><br>21 <sup>st</sup> –25 <sup>th</sup> |  |  |  |   |
| 28<br>Pre Quiz &<br>Concept Map<br>Circulatory<br>System                 |  |  |  |   |

#### March 2005

| Mon  | Tues                                  | Weds | Thurs | Fri  |
|--|---------------------------------------|------|-------|--|
|  | 1<br>Week #1<br>Circulatory Unit      | 2    | 3     | 4  |
| 7<br>Week #2<br>Circulatory Unit                         | 8                                     | 9    | 10    | 11   |
| 14<br>Week #3<br>Circulatory Unit                        | 15                                    | 16   | 17    | 18<br>Post Concept<br>Map<br>& Quiz<br>Circulatory<br>System |
| 21<br>Pre Concept Map<br>& Quiz<br>Respiratory<br>System | 22<br>Week 1<br>Respiratory<br>System | 23   | 24    | 25<br>No School  |

## Appendix C

### *Timeline of Human Body Units Taught and Assessments Administered*

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
| 28   | 29   | 30   | 31   |  |
| No School<br>PD Day<br><br>Week 2<br>Respiratory<br>System | During<br>Instruction admin<br>of online task<br>(11 students) | During<br>Instruction admin<br>of online task<br>(11 students) | During<br>Instruction admin<br>of online task<br>(11 students) |  |

#### **April 2005**

| Mon  | Tues                       | Weds | Thurs | Fri  |
|--|----------------------------|------|-------|--|
|  |                            |      |       | 1  |
| 4  | 5                          | 6    | 7     | 8  |
| Week 3<br>Respiratory<br>System                                |                            |      |       | Post Concept<br>Map<br>& Quiz<br>Respiratory<br>System |
| 11   | 12                         | 13   | 14    | 15   |
| Begin<br>Cardiovascular<br>System                              |                            |      |       | End<br>Cardiovascular<br>System                        |
| <b>April Recess</b><br><b>18<sup>th</sup> –22<sup>nd</sup></b> |                            |      |       |  |
| 25   | 26                         | 27   | 28    | 29   |
| Pre Concept Map<br>& Quiz<br>Digestive<br>System               | Digestive System<br>Week 1 |      |       |  |

#### **May 2005**

| Mon                        | Tues                          | Weds                          | Thurs                         | Fri                           |
|----------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 2                          | 3                             | 4                             | 5                             | 6                             |
| Digestive System<br>Week 2 |                               |                               |                               |                               |
| 8                          | 10                            | 11                            | 12                            | 13                            |
| Digestive System<br>Week 3 |                               |                               |                               |                               |
| 16                         | 17                            | 18                            | 19                            | 20                            |
| Post Concept<br>Map & Quiz | Post-treatment<br>online task | Post-treatment<br>online task | Post-treatment<br>online task | Post-treatment<br>online task |



## Appendix C

### *Timeline of Human Body Units Taught and Assessments Administered*

|  |  |   |  |  |
|--|--|---|--|--|
| <b>Digestive System</b>  | <b>(11 students)</b>   | <b>(11 students)</b>  | <b>(11 students)</b>   | <b>(11 students)</b>   |
| <b>Mon</b>   | <b>Tues</b>  | <b>Weds</b>   | <b>Thurs</b>   | <b>Fri</b>   |
| 23<br><b>Begin Integrated<br/>Body Systems</b>                     | 24   | 25  | 26<br><b>Admin of online<br/>task Blog Task<br/>(all students)</b>     | 27<br><b>Admin of online<br/>task Blog Task<br/>(all students)</b>   |
| 30<br><b>Admin of online<br/>task Blog Task<br/>(all students)</b> | 31<br><b>Admin of online<br/>task Blog Task<br/>(all students)</b> | June 1<br><b>Admin of online<br/>task Blog Task<br/>(all students)</b>    | June 2<br><b>Admin of online<br/>task Blog Task<br/>(all students)</b> | June 3<br><b>Admin of online<br/>task Blog Task<br/>(all students)</b><br><br><b>End Integrated<br/>Body Systems</b> |
| June 6<br><b>Post Integrated<br/>Concept Map</b>                   | June 7<br><b>Post Integrated<br/>Essay</b>                         | June 8<br><b>Post DRP<br/>Assessment of<br/>Reading<br/>Comprehension</b> | June 9   | June 10  |

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

**SECTION 4-2**

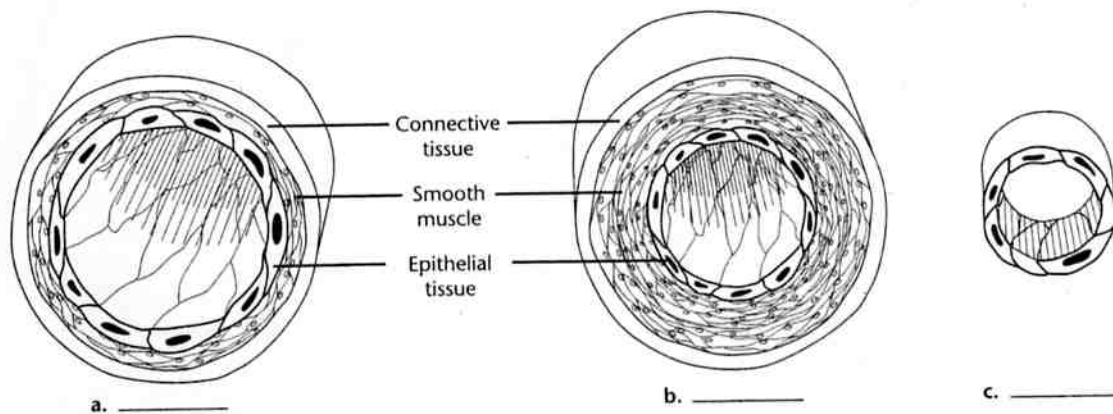
**REVIEW AND REINFORCE**

## A Closer Look at Blood Vessels

### ◆ Understanding Main Ideas

Answer the following questions.

1. Label the diagram with the names of the three kinds of blood vessels.



2. After blood leaves the heart, through what kinds of vessels and in what order does blood move? \_\_\_\_\_
3. In which kind of vessel is blood pressure usually highest? \_\_\_\_\_
4. Which vessel allows diffusion through its walls? \_\_\_\_\_
5. What causes blood pressure?  
\_\_\_\_\_
6. What factors help blood move through veins?  
\_\_\_\_\_

### ◆ Building Vocabulary

Match each term with its definition by writing the letter of the correct definition in the right column on the line beside the term in the left column.

- \_\_\_\_\_ 7. blood pressure
- \_\_\_\_\_ 8. pressure
- \_\_\_\_\_ 9. diffusion
- \_\_\_\_\_ 10. coronary artery
- \_\_\_\_\_ 11. sphygmomanometer

- a. the movement of molecules from an area in which they are highly concentrated to an area in which have a low concentration
- b. the force that something exerts over a given area
- c. an instrument that measures blood pressure
- d. a vessel that supplies the heart itself with blood
- e. caused by the force with which the ventricles contract

Appendix D  
Regular Classroom Instruction Worksheets

Name:  
Period:  
Date:

**“How does the structure and functions of the arteries, capillaries and veins differ?”**

DIRECTIONS: 1.) Read pages 107-110 in textbook.

2.) List facts about the structure and function of each blood vessel in the appropriate column.

| ARTERIES | CAPILLARIES | VEINS |
|----------|-------------|-------|
|          |             |       |

5/11/05  
Lab Activity  
~~~~~

Name:  
Period:  
Date:

## ***“A Walk Through the Digestive System”***

Pre-Lab: CREATE A DEFINITION FOR THE JOB OF EACH PART OF THE DIGESTIVE SYSTEM (using no book or notes)

**Mouth –**

**Esophagus -**

**Stomach -**

**Small intestines -**

**Large intestines –**

**Rectum –**

**Anus –**

**Liver –**

**Gallbladder –**

**Pancreas –**

Lab: Each pair receives a 3x5 card representing food. This food is carried to each digestive structure station where the pair follows the digestion directions ,and takes food to the next sequential station. At the conclusion of the walk through, the student has deposited the “undigested” food with his/her name on it in the anus. Then students will work in groups to answer questions.

Name:

Period:

Date:

## ***MODELING PERISTALSIS***

### PROCEDURE:

- 1.) Obtain a clear, flexible plastic straw.
- 2.) Put on your goggles. Hold the straw vertically and insert a small bead into the top of the straw. The bead should fit snugly into the straw. Do not blow into the straw.
- 3.) Pinch the straw above the bead so that the bead begins to move down the length of the tubing.
- 4.) Repeat Step 3 until the bead exits the straw.

### MAKING MODELS – Answer in complete sentences.

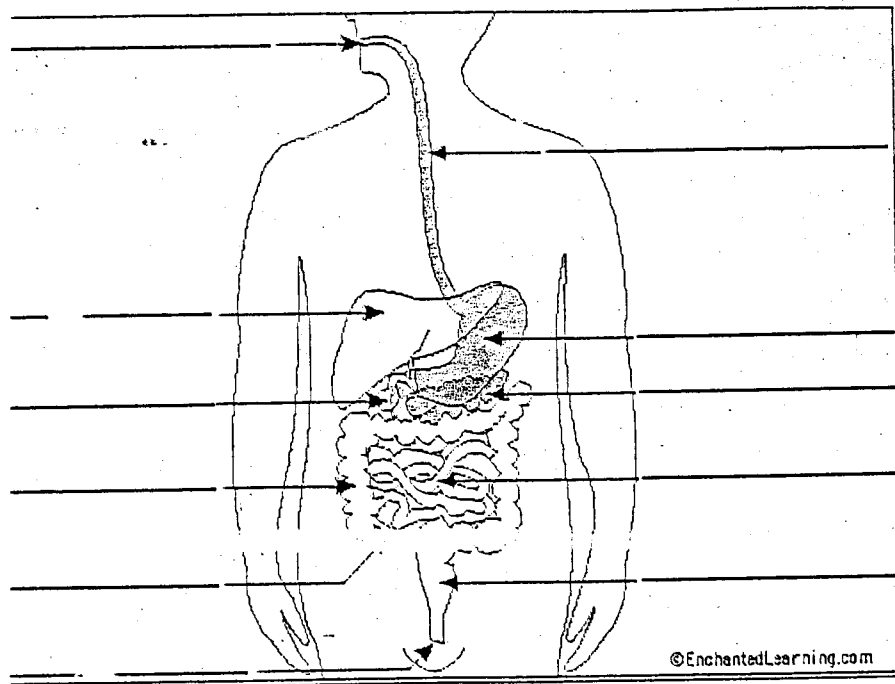
- 1.) How does this action compare with peristalsis?
  - 2.) What do the bead and straw represent in this model?
  - 3.) Explain how you could change this model to represent swallowing food even better.
-

Name:  
Period:  
Date:

## *Parts of the Digestive System*

DIRECTIONS: Match the correct part of the digestive system to its description.

- |                          |                                                                               |
|--------------------------|-------------------------------------------------------------------------------|
| ___ 1.) esophagus        | a.) Contains hydrochloric acid and pepsin that breaks down food and proteins. |
| ___ 2.) liver            | b.) Breaks down medicines and produces bile.                                  |
| ___ 3.) pancreas         | c.) Stores bile.                                                              |
| ___ 4.) stomach          | d.) The majority of chemical digestion and absorption takes place here.       |
| ___ 5.) large intestines | e.) Produces enzymes that go into the small intestines and help digestion     |
| ___ 6.) rectum           | f.) Opening at the end of the rectum                                          |
| ___ 7.) gallbladder      | g.) Absorption of water occurs here.                                          |
| ___ 8.) anus             | h.) A tube that the large intestines ends into                                |



**ORCA- IM Time 1**

**DIRECTIONS (COMBINED OFF- AND ON-SITE RESEARCHER)**

**OFF-SITE RESEARCHER SETUP**

1. Open the email account in epals that you will be using:
  - a. [jillcastek@epals.com](mailto:jillcastek@epals.com)
  - b. two days before your work, create your own epals account and set up your profile. Check the day before your work to be certain your account is operational.
2. Explore and make certain you are comfortable with the epals mail interface.
3. We have found it helpful to send the attachment used during Part II before you begin. (This is described below in Part I but you should do this the night before you begin. The directions are below on pp. 6-7. You may not have enough time to do this once you begin data collection. You need to send an attachment entitled "WHAT TO DO." You will receive this document in the mail with this attachment. Use that document for your attachment. PLEASE CHECK THE BOX TO SEND A COPY OF THE MESSAGE TO YOUR ACCOUNT. THIS WAY, YOU CAN CHCK TO BE CERTAIN YOUR STUDENT RECEIVED THE ATTACHMENT.)
4. Make certain you IM your on-site partner. You must be in AIM, not iChat.
5. Practice saving an IM file. You will need to do this when you are done with each student.
6. The Off-site researcher is responsible for monitoring the time for each part. Note the time students are allowed: 20 minutes (once you begin) for Part I; 15 minutes for Part II. You will need to stick to these time limits. If students are not done on time, you will need to figure out ways to gently have students stop. We provide suggestions below.
7. Read the "Rules for Assistance" (below). You will need to follow these guidelines.
8. Copy and paste from this document, while communicating with the student.
9. You will need to make space on your desktop for three open documents: (1) this script, (2) your IM window with the student, and (3) your IM window with the on-site researcher.
10. The script from "Jill" (below) is what you will be IMing to your student partner.

**ON-SITE INITIAL EQUIPMENT SETUP (Dell Laptop)**

1. Plug power cord into electrical outlet (please do not rely on battery power)
2. Plug green network cable into network jack (please do not rely on wireless system)
3. Power on computer.
4. Launch Camtasia Recorder (Start→Programs→Camtasia Recorder)
5. Launch AIM and Sign in with student's username (usernames for students will match their epal email account username)
6. Plug microphone into jack.

Appendix E  
*Online Reading Comprehension Protocols and Evaluation Rubrics*

7. Start recording with Camtasia (click red record button or F9), post a test message on AIM to the off-site researcher, launch Internet Explorer, go to Google, and test microphone (“testing 1, 2, 3...”)
8. Stop recording with Camtasia (click square icon or F10). Save Movie File As “Date\_test” (i.e Feb9\_2005\_test)
9. Playback Camtasia file to ensure everything is working properly. (Playback of video should launch automatically.) Close window when finished. Listen for audio.
10. Adjust volume if necessary (speaker icon in taskbar).
11. Run a second test of audio capture if necessary. Save Movie File As “Date\_test2”.
12. Minimize Camtasia window. (A red button will appear on the taskbar).
13. Logoff AIM (leave signon window open).
14. Make certain IE appears in a visible location on the desktop.
15. Launch IE
16. Reset the browser log of web sites visited in IE. Do this by going to tools, and find the option for resetting Internet browser. tools-->Internet Options...-->click "clear history" button click OK to close menu window
17. Quit IE
18. Check student name and make certain this student’s epals account is set up and functional.
19. Open the epals account. Check to make certain that a message labeled “Directions” has arrived. If not, ask your off site researcher to send this again. Minimize the epals window.
20. Make certain Word is launched and minimized.
21. Do not launch or minimize IE.

**\*\*Note:** It’s imperative to our data collection that the Camtasia recording be tested at initial setup. Please allow at least 30 minutes to complete the equipment setup and testing before the assessment session begins. (more if this is your first time as an onsite researcher.)

**ADDITIONAL ON-SITE SETUP**

1. Make certain you have your own, additional, laptop connected to the Internet. Use this to communicate to the offsite researcher. Save this IM file for each student. This will track your field notes electronically and provide the offsite researcher with constant context to know if a certain type of support is needed on the other end of IM.
2. IM offsite partner to ensure they are ready and that they have their epals account address and it is open.
3. Retrieve first student from class.



Appendix E  
*Online Reading Comprehension Protocols and Evaluation Rubrics*

**RULES FOR ASSISTANCE TO STUDENT (unless otherwise noted)**

On-Site Researchers

1. *You may clarify the task, itself, but you may not provide any information about how to complete it.*
  - At several points, you will ask the student to explain the task, to make certain they understand it. (This ensures the problem is not due to faulty comprehension of the IM message.)
  - If the student is a poor reader and you think can benefit from you reading the IMs and directions, be certain to read all IMs and directions in the email. Do not read web sites or any thing else.
2. *If the student asks for help, or if you think the student needs help, you are not to provide answers.*
  - We can, though walk them through the steps they've already tried (e.g. "Hmmm...what have you already tried"), or prompt them with "what might you try next?" to see if that helps.

Off-Site Researchers

1. *Students may ask and obtain help from the Online Researcher.*
  - *You may provide strategies to use or answer any questions the student may have via IM. You are an authentic source of strategic knowledge for the student. Do not volunteer, but if they ask, you may answer and explain how to do things.*

**TIMING AND STRATEGY NEEDS RECORDING**

1. When you begin, record the time from the IM window. Use this time as your start time for tracking the time limits for IMing.
2. Students will have 20 total minutes for IMing and solving the problems in Part I.
3. Remind the students when the time for each task is beginning to draw near so they can complete all that they can. Give students a 5 minute warning when time is running out.
4. If, after 17 minutes, students have not completed Tasks 1-3, you are to stop them and move them to part 4. Part 4 will take about 3 minutes. We must collect data for Part 4.
5. If students do not complete Tasks 1-3 in Part I within the 17 minute time frame, transition them to Task 4 in this manner:
  - Can I interrupt?
  - I have something else I need your help on.
  - Here it is. (begin with Task 4)
2. Here is a strategy to wrap up Task 2 if they run out of time at the very end of the session and do not complete Task 2:
  - Hang on. I have a phone call.....
  - Hi again. I have a meeting. I have to leave. Thanks for all your help, today!!
  - You did great and really helped us!! You are all done now. Talk soon!
3. Whenever you see a skill or strategy the student needs and is unfamiliar with, send a description of this to the off-site researcher who will paste it into the skills table. We will use these for instruction during IRT lessons.

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**ON-SITE RESEARCHER CONTEXT SETTING (5 Minutes)**

The on-site researcher sits down with the participant and sets the context with the following introduction.

(Push F9 to begin Camtasia recording. Verify that the red button on task bar is flashing to indicate recording.)

***Onsite researcher:*** I am a student at The University of Connecticut. I've been working with another student at UConn to design Internet lessons. We were hoping you might be able to help us. We will use Instant Messaging and the Internet. We really appreciate you helping us.

Let me show where things are. Here is Word (point to it). Here is IE (point to it). Here is your email account (point to it).

Do you have any questions before we get started? (Wait for student response, clarify any questions that arise)

*Onsite researcher:* I have a few quick questions for you before we start.

**Pre-Task Questions (background knowledge evaluation):**

1. Tell me what you know about Earth's atmosphere. After last item, "Is there anything else you know?"  
(Record responses. 1 pt. for each fact.)
2. Tell me what you know about the atmosphere of any of the other planets? After last item, "Is there anything else you know?"  
(Record responses. 1 pt. for each fact.)

**Think Aloud Preparation**

***Onsite researcher:*** While you are working on the Internet, I want you to tell me what you are thinking. Let me show you what I mean. (Do an example of a think aloud) Hmm. I need to read this paper. Let me see. The title is XXXX. That means this is about XXXX. Now I need to find information about YYYYY. Let me skim this. Oh here it is. It says. ZZZZZ. Do you see how to do this?

## **PART I – 20 MINUTES TOTAL (4 Tasks)**

**TASK 1 (Locate, evaluate, and communicate.) Approximately 7 minutes. Give them more time if they require it. Stop after 17 minutes have expired and move to Task 4. We must gather data on Task 4. Then move to Part II.)**

Onsite: Ask the student to IM the off site student.

Jill: Hi there. I'm collecting facts from seventh graders about the planets in our solar system. Can you help me?

(STUDENT RESPONDS)

Jill: Great! I want to know how the composition of the Earth's atmosphere compares to the atmosphere of another planet. Here are the directions that I want you to follow...

Jill: First, find an important fact on the Internet that a 7<sup>th</sup> grader should know about the Earth's atmosphere. We will compare this fact about Earth with the atmosphere on another planet. OK?

(STUDENT RESPONDS)

Jill: I need this fact to be accurate.

Jill: Send me the important fact that you find. Ask me questions if you need help. I will check with you in a few minutes to see how you are doing.

(PAUSE FOR 2 MINUTES. THEN)

Jill: Remember to look for a fact that you can compare with information from another planet.

*(PAUSE AND WAIT FOR STUDENT TO SEND YOU THIS INFORMATION. Check in after 4 more minutes to see how they are doing. Ask if they have questions. If 20 minutes have expired without an answer, or if you think they are getting frustrated, move to Task 4.)*

(WHEN STUDENTS SEND YOU THE INFORMATION.)

Jill: Great! Can you send me the URL where you found this fact?

(If students do not know this term and ask you, tell them you want to know where they found the information. Type: *Where did you find this information?* Then move on if they still do not understand, type: *That's OK.*)

(STUDENT SENDS URL)

Jill: Great! How do you know the information you found about Earth is accurate?

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**TASK 2. (Locate, evaluate, and communicate. Approximately 7 minutes. Give them more time if they require it. Stop after 17 minutes total time has expired and move to Task 4.)**

*Jill:* Thanks! Now I want you to pick another planet to compare with what you found about Earth. Choose one of these planets: Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto. Which one did you pick?

*Jill:* Now find a fact about the composition of this planet's atmosphere. You want a fact that you can compare with what you found about Earth. Use the Internet. Send me this fact about your planet's atmosphere.

*Jill:* I need this fact to be accurate. OK?

*Jill:* Send me the important fact that you find. Ask me questions if you need help. I will check with you in a few minutes to see how you are doing.

*Onsite Researcher:* Remember, now, to tell me what you are thinking.

*(PAUSE AND WAIT FOR STUDENT TO SEND YOU THIS INFORMATION.)* Check in after 5 minutes to see how they are doing. Ask if they have questions.

*Jill:* How are you doing? Any questions?

After 15 minutes time has expired since beginning the IM session, or if you think they are getting frustrated, move to Task 4. Note: If the student asks and wishes to revise the information they found about Earth, they may go back and do this. Sometimes the information they share about Earth does not match up with information they find about the second planet. If this happens, be certain to ask them about how they know the new information about Earth is accurate. In all cases, though, they may not exceed the time limits for this Part.

**(DO THIS WHILE YOU WAIT IF YOU HAVE NOT DONE SO BEFORE)**

Send an email message to the student you are working with now. The email should contain the directions for Part II (below) as an attachment. You will refer them to this message in Part II, not now.

Here is the message:

Topic: Directions

Message Window: You are doing great! Here are the directions. I have included them as an attachment.

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Attachment (save this, below, as a file and attach to the email. Then send it now.)

\*\*\*\*\*

WHAT TO DO

We want you to evaluate 3 web sites and choose the best one.

Here is what we need. The site should...

1. be good for teachers to use with seventh grade students.
2. have information about all of the planets in the solar system.
3. have information in English and Spanish.

Which of these three sites is the best one to use?

1. <http://atschool.eduweb.co.uk/southwold/project/space/space2.htm>

2. <http://www.nasm.si.edu/research/ceps/etp/etp.htm>

3. We do not know the name or address for the third site. We have lost it. This sentence appears on the site that we are looking for:

Visit links to the Sun, and visit the planets and other small bodies in the Solar System.

Send an email message. Tell one good thing and one bad thing about each site, based on the 3 criteria above. Send your email message to: [jillcastek@epals.com](mailto:jillcastek@epals.com)

Also, please tell us which site is the one best site for us to use and tell us two good reasons to support your decision.

\*\*\*\*\*

(WHEN STUDENTS SEND YOU THE INFORMATION.)

*Jill:* Great! Can you send me the URL where you found this information?

(If students do not know this term and ask you, tell them you want to know where they found the information. Type: *Where did you find this information?* Then move on if they still do not understand, type: *That's OK.*)

(STUDENT SENDS URL)

*Jill:* Great! How do you know the information you found about your planet is accurate?

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**TASK 3. (Synthesize and communicate. Approximately 3 minutes. Give them more time if they require it. Stop after 17 minutes total time have expired since beginning the IM session and move to Task 4.)**

Jill: Please use Microsoft Word to write the answer to this question : How is the atmosphere on Earth and your planet different?

Jill: Save your writing in a Word file and send me an email message with your file attached. You can send it to [jillcastek@epals.com](mailto:jillcastek@epals.com) . Let me know when you are done.

***ON-SITE RESEARCHER: FURTHER CLARIFICATION MAY BE PROVIDED ABOUT THE TASK ITSELF, BUT NOT ABOUT HOW TO DO IT.***

***IF THE STUDENT DOES NOT KNOW HOW TO SEND AN ATTACHMENT, ASK THEM TO SAVE IT ON THE COMPUTER. IF THEY ARE UNABLE TO DO THIS, NOTE THIS AND SAVE IT FOR THEM.***

DRAFT

**TASK 4. (Evaluate. Approximately 3 minutes. Give them more time if they require it. Stop after 20 minutes total time has expired and move to Part II.)**

Note: If you have interrupted students who were unable to complete Task 1-3, you need to send them this message so they do not think they are to complete Task 4 in Word.

Jill: I need you to use IM now, OK?

*Jill:* Thanks! How should students check information on the Internet to make certain it is accurate? What should teachers tell students?

*Wait for participant to IM an answer. Respond appropriately or with:* Thank you – that’s very helpful to know.

## PART II

**TASK 5 (Communicate, locate, evaluate, and communicate. Approximately 15 minutes. If you have not heard from them after 10 minutes, send them the message below.)**

Jill: We are creating a list of the best websites about The Solar System and we’re hoping you can help us find another good site.

Jill: I sent you an email message with our directions, Please see the message. It has an

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attachment.

(NOTE TO OFFSITE RESEARCHER. THIS IS WHAT YOU SENT EARLIER TO THIS STUDENT)

Jill: Did you get it? I can answer questions. If you do not have questions, you can begin.

*Onsite Researcher: Remember, now, to tell me what you are thinking.*

**If they are not done after 10 minutes, remind them of the task:**

Jill: How are you doing? Any questions?

**After 15 minutes, or when they finish, send them this message:**

Jill: Hey, you did great!! I have to leave now. Thank you for all your help. Have a great day!!

DRAFT  
**END OF SESSION**

1. When student has completed the online assessment, stop the Camtasia recording (F10).
2. Save Movie File As "studentname\_pre\_date" (use the student's AIM/ePal username)
3. Signoff from AIM.
4. NOTE: After each student is done, reset the browser log of web sites visited in IE. Do this by going to tools, and find the option for resetting Internet browser. Do this: go to tools, and find the option for resetting Internet browser. tools-->Internet Options...-->click "clear history" button click OK to close menu window

### **DEBRIEFING**

After the student has left, please debrief the session with your research partner. We need two things:

1. A summary of the session, describing generally what took place.
2. A list of skills the student demonstrated he/she did NOT have.

Do this by IM and save this portion of your messaging at the end of the total file.

1. Copy and paste the summary and skill list into a word doc. Save as: studentname-pre-date skills.doc

### **DATA TRANSFER**

**All data files will be transferred to the Maxtor Hard Drive located in the lab as a backup system and to maintain all data files in a central location. This should be completed upon returning from the research site or as soon as possible thereafter.**

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DRAFT



## **ORCA- IM Time 2**

### **DIRECTIONS (COMBINED OFF- AND ON-SITE RESEARCHER)**

#### **OFF-SITE RESEARCHER SETUP**

1. Make certain you IM your on-site partner. You must be in AIM, not iChat.
2. Practice saving an IM file. You will need to do this when you are done with each student.
3. The Off-site researcher is responsible for monitoring the time for each section. Note the time students are allowed for each:
  - 20 minutes (once you begin) for Part I (allow 3 minutes for the final part, #4);
  - 15 minutes for Part II.You will need to stick to these time limits. If students are not done on time, you will need to figure out ways to gently have students stop. We provide suggestions below.
4. Read the “Rules for Assistance” (p. 3 below). You will need to follow these guidelines.
5. Check to see which planet your student selected last time. You need to have them choose a different planet this time. (See pp. 5-6)
6. Copy and paste from this protocol into your IM window, while communicating with the student.
7. You will need to make space on your desktop for three open documents: (1) this script, (2) your IM window with the student, and (3) your IM window with the on-site researcher. Play around until you are comfortable moving back and forth.
8. The script from “You” (below) is what you will be IMing to your student partner.

#### **ON-SITE INITIAL EQUIPMENT SETUP (Dell Laptop)**

Note: It’s imperative to our data collection that the Camtasia recording be tested at initial setup. Please allow at least 30 minutes to complete the equipment setup and testing before the assessment session begins. (more if this is your first time as an onsite researcher.)

1. Plug power cord into electrical outlet (please do not rely on battery power)
2. Plug green network cable into network jack (please do not rely on wireless system)
3. Power on computer.
4. Launch Camtasia Recorder (Start→Programs→Camtasia Recorder)
5. Launch AIM and Sign in with student’s username (usernames for students will match their epal email account username)
6. Plug microphone into jack.
7. Start recording with Camtasia (click red record button or F9), post a test message on AIM to the off-site researcher, launch Internet Explorer, go to Google, and test microphone (“testing 1, 2, 3...”)
8. Stop recording with Camtasia (click square icon or F10). Save Movie File As “Date\_test” (i.e Feb9\_2005\_test)

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9. Playback Camtasia file to ensure everything is working properly. (Playback of video should launch automatically.) Close window when finished. Listen for audio.
10. Adjust volume if necessary (speaker icon in taskbar).
11. Run a second test of audio capture if necessary. Save Movie File As "Date\_test2".
12. Minimize Camtasia window. (A red button will appear on the taskbar).
13. Logoff AIM (leave signon window open).
14. Make certain IE appears in a visible location on the desktop.
15. Launch IE
16. Reset the browser log of web sites visited in IE. Do this by going to tools, and find the option for resetting Internet browser. tools-->Internet Options...-->click "clear history" button click OK to close menu window
17. Quit IE
18. Check student name and make certain this student's epals account is set up and functional.
19. Open the epals account. Check to make certain that a message labeled "Directions" has arrived. If not, ask your off-site researcher to send this again. Minimize the epals window.
20. Make certain Word is launched and minimized.
21. Do not launch or minimize IE.

**ADDITIONAL ON-SITE SETUP**

1. Make certain you have your own, additional, laptop connected to the Internet. Use this to communicate to the offsite researcher. Save this IM file for each student. This will track your field notes electronically and provide the offsite researcher with constant context to know if a certain type of support is needed on the other end of IM.
2. IM offsite partner to ensure they are ready.
3. Retrieve first student from class.

**RULES FOR ASSISTANCE TO STUDENT (unless otherwise noted)**

On-Site Researchers

1. *You may clarify the task, itself, but you may not provide any information about how to complete it.*
  - At several points, you will ask the student to explain the task, to make certain they understand it. (This ensures the problem is not due to faulty comprehension of the IM message.)
  - If the student is a poor reader and you think can benefit from you reading the IMs and directions, be certain to read all IMs and directions in the email. Do not read web sites or any thing else.
  - We can, though walk them through the steps they've already tried (e.g. "Hmmm...what have you already tried"), or prompt them with "what might you try next?" to see if that helps.

Off-Site Researchers

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1. *Students may ask and obtain help from the Off-Site Researcher.*
  - You may provide strategies to use or answer any questions the student may have via IM. You are an authentic source of strategic knowledge for the student. Do not volunteer, but if they ask, you may answer and explain how to do things.

**TIMING AND STRATEGY NEEDS RECORDING**

1. When you begin, record the time from the IM window. Use this time as your start time for tracking the time limits for IMing.
2. Students will have 20 total minutes for IMing and solving the problems in Part I.
3. Remind the students when the time for each task is beginning to draw near so they can complete all that they can. Give students a 5 minute warning when time is running out.
4. If, after 17 minutes, students have not completed Tasks 1-3, you are to stop them and move them to part 4. Part 4 will take about 3 minutes. We must collect data for Part 4.
5. If students do not complete Tasks 1-3 in Part I within the 17 minute time frame, transition them to Task 4 in this manner:  
Can I interrupt?  
I have something else I need your help on.  
Here it is. (begin with Task 4)
2. Here is a strategy to wrap up Task 2 if they run out of time at the very end of the session and do not complete Task 2:  
Hang on. I have a phone call.....  
Hi again. I have a meeting. I have to leave. Thanks for all your help, today!!  
You did great and really helped us!! You are all done now. Thanks! Bye.
3. Whenever you see a skill or strategy the student needs and is unfamiliar with, send a description of this to the off-site researcher who will paste it into the skills table. We will use these for instruction during IRT lessons.

**ON-SITE RESEARCHER CONTEXT SETTING (5 Minutes)**

The on-site researcher sits down with the participant and sets the context with the following introduction.

(Push F9 to begin Camtasia recording. Verify that the red button on task bar is flashing to indicate recording.)

**Onsite researcher:** I am a student at The University of Connecticut. I've been working with another student at UConn to design Internet lessons. We were hoping you might be able to help us again. We will use Instant Messaging and the Internet. We really appreciate you helping us.

Let me show where things are. Here is Word (point to it). Here is IE (point to it). Here is your email account (point to it).

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**Do you have any questions before we get started? (Wait for student response, clarify any questions that arise)**

*Onsite researcher:* I have a few quick questions for you before we start.

**Pre-Task Questions (background knowledge evaluation):**

1. Last time we talked about the Earth's atmosphere. Now we want to know about Neptune. Tell me what you know about Neptune's atmosphere. After the last item, "Is there anything else you know?"  
(Record responses. 1 pt. for each fact.)
2. Tell me what you know about the atmosphere of any of the other planets? After last item, "Is there anything else you know?"  
(Record responses. 1 pt. for each fact.)

**Think Aloud Preparation**

*Onsite researcher:* While you are working on the Internet, I want you to tell me what you are thinking. Do you remember how we do that?

**PART I – 20 MINUTES TOTAL (4 Tasks)**

**TASK 1 (Locate, evaluate, and communicate.) Approximately 7 minutes. Give them more time if they require it. Stop after 17 minutes have expired and move to Task 4. We must gather data on Task 4. Then move to Part II.)**

**Onsite:** Ask the student to IM the off site student.

**You:** Hi there. Like last time, I am collecting facts from seventh graders about the planets in our solar system, but this time it will be with different planets. Can you help me again?

(STUDENT RESPONDS)

**You:** Great! This time I want to know how the composition of Neptune's atmosphere compares to the atmosphere of another planet. Here are the directions that I want you to follow...

**You:** First, find an important fact on the Internet about Neptune's atmosphere. We will compare this fact about Neptune with the atmosphere on another planet. OK?

(STUDENT RESPONDS)

**You:** I need this fact to be accurate.

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**You:** Send me the important fact that you find about Neptune's atmosphere. Ask me questions if you need help. I will check with you in a few minutes to see how you are doing. (PAUSE FOR TWO MINUTES, WHILE THE ONSITE INTERVIEW TAKES PLACE)

**Onsite:** (*We want to see what their search strategies are and how they read search engine results. Ask them these questions at the appropriate times.*)

**As they begin to search:**

1. As you are searching, tell me what you are thinking.

**When search results appear:**

2. As you look at the search engine results, tell me about the decisions you are making.

**You:** Remember to look for a fact that you can compare with information from another planet.

(PAUSE AND WAIT FOR STUDENT TO SEND YOU THIS INFORMATION. Check in after 4 more minutes to see how they are doing. Ask if they have questions. If 20 minutes have expired without an answer, or if you think they are getting frustrated, move to Task 4.)

(WHEN STUDENTS SEND YOU THE INFORMATION.)

**You:** Great! Can you send me the URL where you found this fact?

(If students do not know this term and ask you, tell them you want to know where they found the information. Type: *Where did you find this information?* Then move on if they still do not understand, type: *That's OK.*)

(STUDENT SENDS URL)

**You:** Great! How do you know the information you found about Neptune is accurate?

**TASK 2.** (Locate, evaluate, and communicate. Approximately 7 minutes. Give them more time if they require it. Stop after 17 minutes total time has expired from when you started and then move to Task 4.)

**You:** Thanks! Now I want you to pick another planet to compare with what you found about Neptune. You should choose a different planet than the one you chose last time you did this task.

**You:** Last time you chose XXXX. This time, choose one of these planets: Mercury, Venus, Mars, Jupiter, Saturn, Uranus, and Pluto. Which one did you pick? (**note: delete the planet they selected last time before sending this. See your chart.**)

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**You:** Now find a fact about the composition of this planet's atmosphere. You want a fact that you can compare with what you found about Neptune. Use the Internet. Send me this fact about your planet's atmosphere.

**You:** I need this fact to be accurate. OK?

**You:** Send me the important fact that you find. Ask me questions if you need help. I will check with you in a few minutes to see how you are doing.

*(PAUSE AND WAIT FOR STUDENT TO SEND YOU THIS INFORMATION.)* Check in after 5 minutes to see how they are doing. Ask if they have questions.

**You:** How are you doing? Any questions?

After 15 minutes time has expired since beginning the IM session, or if you think they are getting frustrated, move to Task 4. Note: If the student asks and wishes to revise the information they found about Neptune, they may go back and do this. Sometimes the information they share about Neptune does not match up with information they find about the second planet and they go back and get new information about Neptune. If this happens, be certain to ask them about how they know the new information about Neptune is accurate. In all cases, though, they may not exceed the time limits for this Part.

*(WHEN STUDENTS SEND YOU THE INFORMATION.)*

**You:** Great! Can you send me the URL where you found this information?  
(If students do not know this term and ask you, tell them you want to know where they found the information. Type: *Where did you find this information?* Then move on if they still do not understand, type: *That's OK.*)

*(STUDENT SENDS URL)*

**You:** Great! How do you know the information you found about your planet is accurate?

**TASK 3. (Synthesize and communicate. Approximately 3 minutes. Give them more time if they require it. Stop after 17 minutes total time have expired since beginning the IM session and move to Task 4.)**

**You:** Please use Microsoft Word to write the answer to this question : How is the atmosphere on Neptune and your planet different?

**You:** Save your writing in a Word file. Send Ms. Castek an email message with your file attached. Please send it to [jillcastek@epals.com](mailto:jillcastek@epals.com) . Let me know when you are done.

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***ON-SITE RESEARCHER: FURTHER CLARIFICATION MAY BE PROVIDED ABOUT THE TASK ITSELF, BUT NOT ABOUT HOW TO DO IT.***

***IF THE STUDENT DOES NOT KNOW HOW TO SEND AN ATTACHMENT, ASK THEM TO SAVE IT ON THE COMPUTER. IF THEY ARE UNABLE TO DO THIS, NOTE THIS AND SAVE IT FOR THEM.***

**TASK 4. (Evaluate. Approximately 3 minutes. Give them more time if they require it. Stop after 20 minutes total time has expired and move to Part II.)**

Note: If you have interrupted students who were unable to complete Task 1-3, you need to send them this message, below, so they do not think they are to complete Task 4 in Word.

**You:** I need you to use IM now, OK?

**You:** Thanks! How should students check information on the Internet to make certain it is accurate? What should teachers tell students?

*Wait for participant to IM an answer. Respond appropriately or with: Thank you – that's very helpful to know.*

## PART II

**TASK 5 (Communicate, locate, evaluate, and communicate. Approximately 15 minutes. If you have not heard from them after 10 minutes, send them the message below.)**

**You:** We are creating a list of the best websites about The Solar System and we're hoping you can help us find another good site.

**You:** I sent you an email message with our directions, Please see the message. It has an attachment.

**You:** Did you get it? I can answer questions. If you do not have questions, you can begin.

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NOTE TO OFFSITE RESEARCHER. HERE IS WHAT WAS SENT:

Topic: Directions

Message Window: You are doing great! Here are the directions that Ms. Castek has sent you. She included them as an attachment.

Attachment:

WHAT TO DO

We want you to evaluate 3 web sites and choose the best one.

Here is what we need. The site should have...

1. a lot of interactive games or puzzles about the planets,
2. clear photos and video clips of the solar system;
3. NO advertisements

Which of these three sites is the best one to use?

1. <http://planetescapes.com/>
2. [http://www.jpl.nasa.gov/solar\\_system/](http://www.jpl.nasa.gov/solar_system/)
3. We do not know the name or address for the third site. We have lost it. This sentence appears on the site that we are looking for:  
Astronomy can be one of the most exciting units you teach

Send an email message. Tell one good thing and one bad thing about each site, based on the 3 criteria above.

Also, please tell us which site is the one best site for us to use and tell us two good reasons to support your decision. Send your email message to Ms. Castek at: [jillcastek@epals.com](mailto:jillcastek@epals.com)

\*\*\*\*\*

**Onsite: We want to find out their understanding of this message. After they open and read this message, ask them, “ Tell me what you are going to do now?”**

**If they are not done after 10 minutes, remind them of the task:**

**You:** How are you doing? Any questions? I have about five more minutes before I have meeting.



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**Onsite:** If students complete the task, we want to know what their synthesis strategies were. Ask them, “How did you figure out your decision about the websites?”

**After 15 minutes, or when they finish, send them this message:**

**You:** Hang on a sec – I have a phone call.

**You:** I have to go, but you did great!! Thank you for all your help. Have a great day!!

**END OF SESSION**

1. When student has completed the online assessment, stop the Camtasia recording (F10).
2. Save Movie File As “studentname\_pre\_date” (use the student’s AIM/ePal username)
3. Signoff from AIM.
4. NOTE: After each student is done, reset the browser log of web sites visited in IE. Do this by going to tools, and find the option for resetting Internet browser. Do this: go to tools, and find the option for resetting Internet browser. tools-->Internet Options...-->click "clear history" button click OK to close menu window

**DEBRIEFING**

After the student has left, please debrief the session with your research partner. We need two things:

1. A summary of the session, describing generally what took place.
2. A list of skills the student demonstrated he/she did NOT have.

Do this by IM and save this portion of your messaging at the end of the total file.

1. Copy and paste the summary and skill list into a word doc. Save as: studentname-pre-date skills.doc

**DATA TRANSFER**

**All data files will be transferred to the Maxtor Hard Drive located in the lab as a backup system and to maintain all data files in a central location. This should be completed upon returning from the research site or as soon as possible thereafter.**

## **ORCA- IM Time 3**

### **DIRECTIONS (COMBINED OFF- AND ON-SITE RESEARCHER)**

#### **OFF-SITE RESEARCHER SETUP**

1. Make certain you IM your on-site partner. You must be in AIM, not iChat.
2. Practice saving an IM file. You will need to do this when you are done with each student.
3. The Off-site researcher is responsible for monitoring the time for each section. Note the time students are allowed for each:
  - 20 minutes (once you begin) for Part I (allow 3 minutes for the final part, #4);
  - 15 minutes for Part II.You will need to stick to these time limits. If students are not done on time, you will need to figure out ways to gently have students stop. We provide suggestions below.
4. Read the “Rules for Assistance” (p. 3 below). You will need to follow these guidelines.
5. Check to see which planet your student selected last time. You need to have them choose a different planet this time. (See pp. 5-6)
6. Copy and paste from this protocol into your IM window, while communicating with the student.
7. You will need to make space on your desktop for three open documents: (1) this script, (2) your IM window with the student, and (3) your IM window with the on-site researcher. Play around until you are comfortable moving back and forth.
8. The script from “You” (below) is what you will be IMing to your student partner.

#### **ON-SITE INITIAL EQUIPMENT SETUP (Dell Laptop)**

Note: It’s imperative to our data collection that the Camtasia recording be tested at initial setup. Please allow at least 30 minutes to complete the equipment setup and testing before the assessment session begins. (more if this is your first time as an onsite researcher.)

1. Plug power cord into electrical outlet (please do not rely on battery power)
2. Plug green network cable into network jack (please do not rely on wireless system)
3. Power on computer.
4. Launch Camtasia Recorder (Start→Programs→Camtasia Recorder)
5. Launch AIM and Sign in with student’s username (usernames for students will match their epal email account username)
6. Plug microphone into jack.
7. Start recording with Camtasia (click red record button or F9), post a test message on AIM to the off-site researcher, launch Internet Explorer, go to Google, and test microphone (“testing 1, 2, 3...”)
8. Stop recording with Camtasia (click square icon or F10). Save Movie File As “Date\_test” (i.e Feb9\_2005\_test)

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9. Playback Camtasia file to ensure everything is working properly. (Playback of video should launch automatically.) Close window when finished. Listen for audio.
10. Adjust volume if necessary (speaker icon in taskbar).
11. Run a second test of audio capture if necessary. Save Movie File As "Date\_test2".
12. Minimize Camtasia window. (A red button will appear on the taskbar).
13. Logoff AIM (leave signon window open).
14. Make certain IE appears in a visible location on the desktop.
15. Launch IE
16. Reset the browser log of web sites visited in IE. Do this by going to tools, and find the option for resetting Internet browser. tools-->Internet Options...-->click "clear history" button click OK to close menu window
17. Quit IE
18. Check student name and make certain this student's epals account is set up and functional.
19. Open the epals account. Check to make certain that a message labeled "Directions" has arrived. If not, ask your off-site researcher to send this again. Minimize the epals window.
20. Make certain Word is launched and minimized.
21. Do not launch or minimize IE.

**ADDITIONAL ON-SITE SETUP**

1. Make certain you have your own, additional, laptop connected to the Internet. Use this to communicate to the offsite researcher. Save this IM file for each student. This will track your field notes electronically and provide the offsite researcher with constant context to know if a certain type of support is needed on the other end of IM.
2. IM offsite partner to ensure they are ready.
3. Retrieve first student from class.

**RULES FOR ASSISTANCE TO STUDENT (unless otherwise noted)**

On-Site Researchers

1. *You may clarify the task, itself, but you may not provide any information about how to complete it.*
  - At several points, you will ask the student to explain the task, to make certain they understand it. (This ensures the problem is not due to faulty comprehension of the IM message.)
  - If the student is a poor reader and you think can benefit from you reading the IMs and directions, be certain to read all IMs and directions in the email. Do not read web sites or any thing else.
  - We can, though walk them through the steps they've already tried (e.g. "Hmmm...what have you already tried"), or prompt them with "what might you try next?" to see if that helps.

Off-Site Researchers

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1. *Students may ask and obtain help from the Off-Site Researcher.*
  - You may provide strategies to use or answer any questions the student may have via IM. You are an authentic source of strategic knowledge for the student. Do not volunteer, but if they ask, you may answer and explain how to do things.

**TIMING AND STRATEGY NEEDS RECORDING**

1. When you begin, record the time from the IM window. Use this time as your start time for tracking the time limits for IMing.
2. Students will have 20 total minutes for IMing and solving the problems in Part I.
3. Remind the students when the time for each task is beginning to draw near so they can complete all that they can. Give students a 5 minute warning when time is running out.
4. If, after 17 minutes, students have not completed Tasks 1-3, you are to stop them and move them to part 4. Part 4 will take about 3 minutes. We must collect data for Part 4.
5. If students do not complete Tasks 1-3 in Part I within the 17 minute time frame, transition them to Task 4 in this manner:

Can I interrupt?

I have something else I need your help on.

Here it is. (begin with Task 4)
2. Here is a strategy to wrap up Task 2 if they run out of time at the very end of the session and do not complete Task 2:

Hang on. I have a phone call.....

Hi again. I have a meeting. I have to leave. Thanks for all your help, today!!

You did great and really helped us!! You are all done now. Thanks! Bye.
3. Whenever you see a skill or strategy the student needs and is unfamiliar with, send a description of this to the off-site researcher who will paste it into the skills table. We will use these for instruction during IRT lessons.

**ON-SITE RESEARCHER CONTEXT SETTING (5 Minutes)**

The on-site researcher sits down with the participant and sets the context with the following introduction.

(Push F9 to begin Camtasia recording. Verify that the red button on task bar is flashing to indicate recording.)

***Onsite researcher:*** I am a student at The University of Connecticut. I've been working with another student at UConn to design Internet lessons. We were hoping you might be able to help us again. We will use Instant Messaging and the Internet. We really appreciate you helping us.

**Let me show where things are. Here is Word (point to it). Here is IE (point to it). Here is your email account (point to it).**

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**Do you have any questions before we get started? (Wait for student response, clarify any questions that arise)**

*Onsite researcher:* I have a few quick questions for you before we start.

**Pre-Task Questions (background knowledge evaluation):**

1. Last time we talked about the Earth's atmosphere. Now we want to know about Neptune. Tell me what you know about Neptune's atmosphere. After the last item, "Is there anything else you know?"  
(Record responses. 1 pt. for each fact.)
2. Tell me what you know about the atmosphere of any of the other planets? After last item, "Is there anything else you know?"  
(Record responses. 1 pt. for each fact.)

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**Think Aloud Preparation**

***Onsite researcher:* While you are working on the Internet, I want you to tell me what you are thinking. Do you remember how we do that?**

**PART I – 20 MINUTES TOTAL (4 Tasks)**

**TASK 1 (Locate, evaluate, and communicate.) Approximately 7 minutes. Give them more time if they require it. Stop after 17 minutes have expired and move to Task 4. We must gather data on Task 4. Then move to Part II.)**

**Onsite:** Ask the student to IM the off site student.

**You:** Hi there. Like last time, I am collecting facts from seventh graders about the planets in our solar system, but this time it will be with different planets. Can you help me again?

(STUDENT RESPONDS)

**You:** Great! This time I want to know how the composition of Saturn's atmosphere compares to the atmosphere of another planet. Here are the directions that I want you to follow...

**You:** First, find an important fact on the Internet about Saturn's atmosphere. We will compare this fact about Saturn with the atmosphere on another planet. OK?

(STUDENT RESPONDS)

**You:** I need this fact to be accurate.

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**You:** Send me the important fact that you find about Saturn's atmosphere. Ask me questions if you need help. I will check with you in a few minutes to see how you are doing. (PAUSE FOR TWO MINUTES, WHILE THE ONSITE INTERVIEW TAKES PLACE)

**Onsite:** (*We want to see what their search strategies are and how they read search engine results. Ask them these questions at the appropriate times.*)

**As they begin to search:**

1. As you are searching, tell me what you are thinking.

**When search results appear:**

2. As you look at the search engine results, tell me about the decisions you are making.

**You:** Remember to look for a fact that you can compare with information from another planet.

DRAFT

(PAUSE AND WAIT FOR STUDENT TO SEND YOU THIS INFORMATION. Check in after 4 more minutes to see how they are doing. Ask if they have questions. If 20 minutes have expired without an answer, or if you think they are getting frustrated, move to Task 4.)

(WHEN STUDENTS SEND YOU THE INFORMATION.)

**You:** Great! Can you send me the URL where you found this fact?

(If students do not know this term and ask you, tell them you want to know where they found the information. Type: *Where did you find this information?* Then move on if they still do not understand, type: *That's OK.*)

(STUDENT SENDS URL)

**You:** Great! How do you know the information you found about Saturn is accurate?

**TASK 2.** (Locate, evaluate, and communicate. Approximately 7 minutes. Give them more time if they require it. Stop after 17 minutes total time has expired from when you started and then move to Task 4.)

**You:** Thanks! Now I want you to pick another planet to compare with what you found about Neptune. You should choose a different planet than the one you chose last time you did this task.

**You:** For the first two times, you chose XXXX and XXXX. This time, choose one of these planets: Mercury, Venus, Mars, Jupiter, Uranus, and Pluto. Which one did you pick? (**note: delete the planet they selected last time before sending this. See your chart.**)

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**You:** Now find a fact about the composition of this planet's atmosphere. You want a fact that you can compare with what you found about Saturn. Send me this fact about your planet's atmosphere.

**You:** I need this fact to be accurate. OK?

**You:** Send me the important fact that you find. Ask me questions if you need help. I will check with you in a few minutes to see how you are doing.

*(PAUSE AND WAIT FOR STUDENT TO SEND YOU THIS INFORMATION.)* Check in after 5 minutes to see how they are doing. Ask if they have questions.

**You:** How are you doing? Any questions?

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After 15 minutes time has expired since beginning the IM session, or if you think they are getting frustrated, move to Task 4. Note: If the student asks and wishes to revise the information they found about Neptune, they may go back and do this. Sometimes the information they share about Neptune does not match up with information they find about the second planet and they go back and get new information about Neptune. If this happens, be certain to ask them about how they know the new information about Neptune is accurate. In all cases, though, they may not exceed the time limits for this Part.

*(WHEN STUDENTS SEND YOU THE INFORMATION.)*

**You:** Great! Can you send me the URL where you found this information?

(If students do not know this term and ask you, tell them you want to know where they found the information. Type: *Where did you find this information?* Then move on if they still do not understand, type: *That's OK.*)

*(STUDENT SENDS URL)*

**You:** Great! How do you know the information you found about your planet is accurate?

**TASK 3. (Synthesize and communicate. Approximately 3 minutes. Give them more time if they require it. Stop after 17 minutes total time have expired since beginning the IM session and move to Task 4.)**

**You:** Please use Microsoft Word to write the answer to this question: How is the atmosphere on Neptune and your planet different?

**You:** Save your writing in a Word file. Send Ms. Castek an email message with your file attached. Please send it to [jillcastek@epals.com](mailto:jillcastek@epals.com). Let me know when you are done.

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***ON-SITE RESEARCHER: FURTHER CLARIFICATION MAY BE PROVIDED ABOUT THE TASK ITSELF, BUT NOT ABOUT HOW TO DO IT.***

***IF THE STUDENT DOES NOT KNOW HOW TO SEND AN ATTACHMENT, ASK THEM TO SAVE IT ON THE COMPUTER. IF THEY ARE UNABLE TO DO THIS, NOTE THIS AND SAVE IT FOR THEM.***

**TASK 4. (Evaluate. Approximately 3 minutes. Give them more time if they require it. Stop after 20 minutes total time has expired and move to Part II.)**

Note: If you have interrupted students who were unable to complete Task 1-3, you need to send them this message, below, so they do not think they are to complete Task 4 in Word.

**You:** I need you to use IM now, OK?

**You:** Thanks! How should students check information on the Internet to make certain it is accurate? What should teachers tell students?

*Wait for participant to IM an answer. Respond appropriately or with: Thank you – that’s very helpful to know.*

## **PART II**

**TASK 5 (Communicate, locate, evaluate, and communicate. Approximately 15 minutes. If you have not heard from them after 10 minutes, send them the message below.)**

**You:** We are creating a list of the best websites about The Solar System and we’re hoping you can help us find another good site.

**You:** I sent you an email message with our directions, Please see the message. It has an attachment.

**You:** Did you get it? I can answer questions. If you do not have questions, you can begin.



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NOTE TO OFFSITE RESEARCHER. HERE IS WHAT WAS SENT:

Topic: Directions

Message Window: You are doing great! Here are the directions that Ms. Castek has sent you. She included them as an attachment.

Attachment:

WHAT TO DO

We want you to evaluate 3 web sites and choose the best one.

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Here is what we need. The site should ...

1. be good for teachers to use with a whole class of seventh grade students.
2. have information about all of the planets in the solar system.
3. have NO advertisements

Which of these three sites is the best one to use?

Here are two of the sites:

1. [http://encarta.msn.com/encyclopedia\\_761557663/Solar\\_System.html#s2](http://encarta.msn.com/encyclopedia_761557663/Solar_System.html#s2)
2. <http://www.solarviews.com/eng/homepage.htm>
3. We do not know the name or address for the third site. We have lost it. This sentence appears on the site that we are looking for:  
C02 preserves space junk

Send an email message. Tell one good thing and one bad thing about each site, based on the 3 criteria above.

Also, please tell us which site is the one best site for us to use and tell us two good reasons to support your decision. Send your email message to Ms. Castek at: [jillcastek@epals.com](mailto:jillcastek@epals.com)

\*\*\*\*\*

**Onsite: We want to find out their understanding of this message. After they open and read this message, ask them, “ Tell me what you are going to do now?”**

**If they are not done after 10 minutes, remind them of the task:**

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**You:** How are you doing? Any questions? I have about five more minutes before I have meeting.

**Onsite:** If students complete the task, we want to know what their synthesis strategies were. Ask them, “How did you figure out your decision about the websites?”

**After 15 minutes, or when they finish, send them this message:**

**You:** Hang on a sec – I have a phone call.

**You:** I have to go, but you did great!! Thank you for all your help. Have a great day!!

### **END OF SESSION**

1. When student has completed the online assessment, stop the Camtasia recording (F10).
2. Save Movie File As “studentname\_pre\_date” (use the student’s AIM/ePal username)
3. Signoff from AIM.
4. NOTE: After each student is done, reset the browser log of web sites visited in IE. Do this by going to tools, and find the option for resetting Internet browser. Do this: go to tools, and find the option for resetting Internet browser. tools-->Internet Options...-->click "clear history" button click OK to close menu window

### **DEBRIEFING**

After the student has left, please debrief the session with your research partner. We need two things:

1. A summary of the session, describing generally what took place.
2. A list of skills the student demonstrated he/she did NOT have.

Do this by IM and save this portion of your messaging at the end of the total file.

1. Copy and paste the summary and skill list into a word doc. Save as: studentname-pre-date skills.doc

### **DATA TRANSFER**

**All data files will be transferred to the Maxtor Hard Drive located in the lab as a backup system and to maintain all data files in a central location. This should be completed upon returning from the research site or as soon as possible thereafter.**

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**Evaluation Rubric ORCA IM Times 1,2 and 3**

**Scoring Rubric: INTERNET COMPREHENSION TASK (ICT)**

**TASK 1: Use a search engine to locate an important and accurate fact about the composition of the Neptune's atmosphere that can be later compared with a related fact about a planet of the student's choice. Then send the fact & URL of the website via an Instant message.**

1A. SKILLS REQUIRED: Query a search engine (given an open-ended prompt), navigate through search results, and locate relevant fact about a planet's atmosphere, and communicate information via IM

- 0 = Unable to complete the task. Attempted to complete task without a search engine by typing in guessed URL's, or queried a search engine to explore search results, but did not locate a relevant fact about the planet's atmosphere (maybe found a website about the planet itself, or another fact, but not a particular fact about the Earth's atmosphere).
- 1 = Student queried a search engine, navigated through search results, located a relevant fact about the planet's atmosphere, and communicated that fact in an Instant Message but required *some support* from the offsite researcher.
- 2 = Student queried a search engine, navigated through search results, located a relevant fact about the planet's atmosphere, and communicated that fact in an Instant Message with *no support* from the offsite researcher.

IB. SKILLS REQUIRED: Use IM to communicate the URL associated with the webpage where the fact was found

- 0 = Unable to communicate through IM the URL associated with the webpage where the fact was found.
- 1 = Student communicated the URL in Instant Message, but used inefficient strategies (e.g., typed the whole URL by hand).
- 2 = Student communicated the URL in Instant Message, and used efficient strategies (e.g., cut and paste).

1C. SKILLS REQUIRED: When prompted, demonstrate how to verify the accuracy of the fact that was found about the planet's atmosphere. NOTE: *This task measures the student's awareness/use of the possible procedures to use for evaluating a website when prompted, not necessarily if the student would employ these procedures without prompting.*

- 0 = Student unable to provide a reason for the accuracy of the information found (e.g., "I don't know) or gave an inappropriate reason (e.g., "It looks professional", "It must be true, it's on the Internet"; Google always gives accurate information).
- 1 = Student assumed the information was accurate and based the decision on at least one appropriate general procedure for verifying the information including: (a) "the organization that sponsors the site should be credible"; (b) "You should be able to find the same fact on another website or in a book" (c) "You can ask a friend or a teacher"; (d) "I learned that last year", etc.
- 2 = Student actively sought to verify the accuracy of the information by a) reading to learn more about the purpose or credibility of the site's sponsor; (b) searching to find another site that provided the same information; (c) relating the fact to one already known or learned earlier; (d) reading/searching to learn more about the credibility of the author; (e) find out who else is linking to the site (linkto: strategy); etc.

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**TASK 2: Select a second planet and use a search engine to locate a related (and accurate) fact about that planet's atmosphere that can be compared to the fact found earlier about Neptune. Then send the fact & URL of this website via an Instant message.**

2A. SKILLS REQUIRED: Query a search engine (given an open-ended prompt), navigate through search results, and locate relevant fact about a planet's atmosphere., and communicate information via IM

- 0 = Unable to complete the task. Attempted to complete task without a search engine by typing in guessed URL's, or queried a search engine to explore search results, but did not locate a relevant fact about the planet's atmosphere (maybe found a website about the planet itself, or another fact, but not a particular fact about the Earth's atmosphere).
- 1 = Student queried a search engine, navigated through search results, located a relevant fact about the planet's atmosphere, and communicated that fact in an Instant Message but required *some support* from the offsite researcher.
- 2 = Student queried a search engine, navigated through search results, located a relevant fact about the planet's atmosphere, and communicated that fact in an Instant Message with *no support* from the offsite researcher.

2B. SKILLS REQUIRED: Used IM to communicate the URL associated with the webpage where the fact was found

- 0 = Unable to communicate through IM the URL associated with the webpage where the fact was found.
- 1 = Student communicated the URL in Instant Message, but used inefficient strategies (e.g., typed the whole URL by hand).
- 2 = Student communicated the URL in Instant Message, and used efficient strategies (e.g., cut and paste).

2C. SKILLS REQUIRED: When prompted, demonstrate how to verify the accuracy of the fact that was found about Neptune's atmosphere. NOTE: *This task measures the student's awareness/use of the possible procedures to use for evaluating a website when prompted, not necessarily if the student would employ these procedures without prompting.*

- 0 = Student unable to provide a reason for the accuracy of the information found (e.g., "I don't know) or gave an inappropriate reason (e.g., "It looks professional", "It must be true, it's on the Internet"; Google always gives accurate information).
- 1 = Student assumed the information was accurate and based the decision on at least one appropriate general procedure for verifying the information including: (a) "the organization that sponsors the site should be credible"; (b) "You should be able to find the same fact on another website or in a book" (c) "You can ask a friend or a teacher"; (d) "I learned that last year", etc.
- 2 = Student actively sought to verify the accuracy of the information by a) reading to learn more about the purpose or credibility of the site's sponsor; (b) searching to find another site that provided the same information; (c) relating the fact to one already known or learned earlier; (d) reading/searching to learn more about the credibility of the author; (e) find out who else is linking to the site (linkto: strategy); etc.

2D: How should students check information on the Internet to make certain it is accurate? What should teachers tell students?

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- 0 = Provided an inaccurate or inappropriate strategy or no strategy for validating the accuracy of information.
- 1 = Provided at least one appropriate strategy for validating the accuracy of information

**TASK 3: Use Microsoft Word to write a short passage that synthesizes how the atmosphere on Earth and another planet is different. Save the passage in a Word file and then send via email as an attachment.**

3A: SKILLS REQUIRED: Synthesize (and compare) information from two different locations

- 0 = Student did not provide any written explanation that compared the atmosphere of Earth and another planet or just copy/pasted the two facts they found earlier.
- 1 = Written explanation included at least one fact about the atmosphere of one planet but did not include any comparison to the atmosphere on a second planet.
- 2 = Written explanation included at least one fact about the atmosphere of two planets, but no evidence of attempt to compare or synthesize the two facts in his/her own words (or the explanation was not relevant to the task).
- 3 = Written explanation included at least one fact about of the atmosphere of two planets AND a statement of comparison or original synthesis beyond facts communicated in Task 1 and 2.

3B: SKILLS REQUIRED: Communicate information gleaned from two locations using email and an email attachment

- 0 = Student was not able to send an email message or an email message with an attached word document.
- 1 = Student composed and sent the information in an email message or in IM message *instead* of sending as a word document OR student composed a word document but did not know how to attach it in email (or ran out of time).
- 2 = Student composed an email message and attached a word document, but the email message contained only one of the following two elements:
- (a) a subject line with an appropriate label related to the context of the message;
  - (b) a brief message indicating the contents of the attached file.
- 3 = Student composed and sent an email message with an attachment that contained both of the elements above.

**TASK 4: Read the email message I sent you and open the Microsoft Word attachment that contains the following directions: Please visit three sites and give your opinion of each. Two sites are provided and one you'll need to search for, given text that is found on that page. Send me an email telling me a good thing and a bad thing about each site and why. Your criteria should be based on the three criteria listed in the directions. Then, let me know which site you think is the best for us to use and tell us two good reasons to support your decision. Make sure your email is clear so we understand your points.**

4A: SKILLS REQUIRED: Locate task directions by opening/reading an email message AND an attached Microsoft Word document.

- 0 = Student was unable to access or open the email message on the ePals account.
- 1 = Student opened the email message, but was not able to open the attachment (or did not read carefully to realize it was necessary to open the attachment).

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- 2 = Student opened the email message AND the attachment *with some support* from the offline or online researcher (or finally figured it out by accident in a very inefficient manner). .
- 3 = Student opened the email message AND the attachment *with no support* from the researchers.

4B: SKILLS REQUIRED: Access two websites given the URL in a Microsoft Word document.

- 0 = Given two hyperlinks to follow in MS Word, student was unable to access either of the websites. Did not know how to click on hyperlinks to access the webpage, tried to do a search, or ran out of time before accessed either website with URLs.
- 1 = Given two hyperlinks to follow in MS Word, student was able to access only one of the websites. Had difficulty accessing one of the links or ran out of time before accessed both websites with URLs.
- 2 = Given two hyperlinks to follow in MS Word, student was able to access two websites

4C: SKILLS REQUIRED: Query a search engine to efficiently locate a website given a sentence that is found in the text of the website.

- DRAFT**
- 0 = When given an actual phrase found on a site, student was unable to access the third website. Could not conduct a search or attempted to complete the task without a search engine, typing in various URL's which led to irrelevant sites or nowhere.
- 1 = When given an actual phrase found on a site, student located a website but it was not the correct website.
- 2 = When given an actual phrase found on a site, student located the correct website (see below):  
TIME 1: DON'T SCORE THIS ITEM- they just clicked on all three!!!  
TIME 2: [http://www.kidsastronomy.com/teachers\\_corner.htm](http://www.kidsastronomy.com/teachers_corner.htm)  
TIME 3: <http://www.bbc.co.uk/science/space/index.shtml>

4D: SKILLS REQUIRED: Evaluate information on three different websites

- 0 = Did not identify any positive or negative aspects of any of the three websites requested (or included information not relevant to the task).
- 1 = Identified good or bad aspects related to the criteria, but only through think-aloud in IM.
- 2 = Identified one good OR bad thing about ONE website related to the criteria
- 3 = Identified one good AND bad thing about ONE website (Or one aspect of TWO websites).
- 4 = Identified one good AND bad thing about TWO websites related to the criteria. (or one aspect of THREE websites)
- 5 = Identified one good AND bad thing about all three websites

TIME1 Criteria: a) useful for seventh graders, b) includes information about all planets, c) useful for seventh graders and available in English and Spanish.

TIME 2 Criteria: a) includes interactive games or puzzles about the planets b) has clear photos and video clips of the solar system; c) NO advertisements

TIME 3 Criteria: a) useful for seventh graders, b) information about all planets, c) NO advertisements

4E: SKILLS REQUIRED: Synthesize information from three different websites

- 0 = Did not provide his/her opinion of the best website OR did not visit all three websites. .

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- 1 = Rated one website as the best, but only in think-aloud or IM.
- 2 = Rated one website as the best but did not provide any relevant evidence to support his/her choice.
- 3 = Rated one website as the best and supported his/her choice with one piece of specific evidence related to the criteria that supported his/her choice.
- 4 = Rated one website as the best and supported his/her choice with more than one piece of specific evidence related to the criteria that supported his/her choice.
- 4F: SKILLS REQUIRED: Communicate information gleaned from three different websites using email
- 0 = Student was not able to compose and send an email message that communicated a final decision about the best website.
- 1 = Student composed an email message but ran out of time before could send it along.
- 2 = Student composed and sent an email that contained only one of the following three elements:
- (c) a subject line with an appropriate label related to the context of the message;
  - (d) a greeting or closing or both as part of the message;
  - (e) evidence that the writer accurately shared the context of the message within the body to suggest an understanding of audience and purpose (e.g., included name of website or URL to help reader understand the site referred to, wrote in clear sentences that reader could understand, etc).
- 3 = Student composed an email message that contained two of the three elements above.



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**ORCA- Blog Task**

A **Sample** of Online Assessment# 4 is available at:  
[http://newliteracies.typepad.com/science\\_exchange/](http://newliteracies.typepad.com/science_exchange/)

DIRECTIONS Provided to Students

Here is a blog on the Internet with your name on it. There are three posts at your location. We want you to click on your name and help these teachers who have asked for your help. You will need to post your comments for these teachers at this site so they know what you think and what you found for them

Do you have any questions?

You have 30 minutes.

Try to complete as much as you can.

Please get started.

BLOG REQUEST #1 - Title: Help Needed

**BLOG MESSAGE**

**Mr. Thomas' 7th grade class needs your help. They lost their bookmarks and are trying to find the sites they were using in their science class. The description of what they need is in the attached email.**

**Please help this class get back to their sites. They will really appreciate it.**

**ATTACHMENT**

**From:** [mikethomas@epals.com](mailto:mikethomas@epals.com)

**To:** [MBAstudent@epals.com](mailto:MBAstudent@epals.com)

**Received:** May 24, 2005 3:35 pm

**Subject:** Can you help us?

Dear MBA student,

I feel funny to ask, but we are not very good at searching. Can you help with two things?

**NEED HELP #1.** We have lost the links to two sites on human body systems.

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*Online Reading Comprehension Protocols and Evaluation Rubrics*

**Site A:** We need the site found at **human anatomy online**. The address we need will take us to the **cardiovascular system**. Can you post the address for this site and the website title?

**Site B:** We need the site where two separate phrases appear: **educators and staff** and **human body**. There is a picture of a man having an x-ray of his arm. Can you post the address for this site and website title?

**NEED HELP #2.**

We want to know which of these sites (A or B) you think is best. The best site should:

- a) Have lots of information about the entire human body.
- b) Have very few ads.

When you find these sites, put them on the blog so we can get them. In your post, tell us which of the two sites (A or B) you think is best for us. **Include your reasons why it's best.**

Thanks!

Mr. Thomas and 7<sup>th</sup> Grade Science Students  
Memphis, Tennessee

BLOG REQUEST # 2 – Title: Resources Needed

**BLOG MESSAGE**

**Mrs. Jamison's 7th grade class in Newark, New Jersey needs your help. They're in need of Internet resources for studying the digestive system. She has sent you a description of what her class needs. Please read her email and post your response on this blog.**

**This seventh grade class is counting on you !!**

**ATTACHMENT**

**From:** [janetjamison@epals.com](mailto:janetjamison@epals.com)

**To:** [MBAstudent@epals.com](mailto:MBAstudent@epals.com)

**Received:** May 25, 2005 2:19pm

**Subject:** A Digestive Animated Graphic Needed

Dear MBA student,

My class is studying the human body. Can you search the Internet and help us find a good digestive system site?

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The site needs to contain a good animated graphic showing the human digestive system.  
The site should ...

- a) Provide accurate information
  - b) NOT contain advertisements
  - c) Be good for a 7<sup>th</sup> grade class
1. Include the name and address of the site.
  2. Tell us how to check that information on a site like this is accurate.

Please post a response on this blog with the best website you can find. The students in my class will read the posts and use the sites you recommend.

Your ideas will be a big help!

Mrs. Jamison  
7<sup>th</sup> grade science teacher

DRAFT

BLOG REQUEST #3 – Title: More Resources Needed

**BLOG MESSAGE**

**Here is another request from Mrs. Jamison's 7th grade class. They also need a great site for studying the respiratory system. Her specific needs are in the attached email message. Can you read this email and post your response here?**

**I know they will really appreciate your help!**

**ATTACHMENT**

**From:** [janetjamison@epals.com](mailto:janetjamison@epals.com)  
**To:** [MBAstudent@epals.com](mailto:MBAstudent@epals.com)  
**Received:** May 25, 2005 1:13 pm

**Subject:** A Respiratory Animated Graphic Needed Too!

Dear MBA student,

Hi again. My class also needs a good animation on the respiratory system.

Post a web site with a good animated graphic about the human respiratory system. The site should ...

- a) Provide accurate information

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*Online Reading Comprehension Protocols and Evaluation Rubrics*

- b) NOT contain advertisements
- c) Be good for a 7<sup>th</sup> grade class

Include:

1. The name and address of the site.
2. Your opinion: How does knowing who created the site help you to evaluate its accuracy?

Please post a response on this blog with the best website you can find. The students in my class will read the posts and use the sites you recommend.

Thank you again!

Janet Jamison

DRAFT

Appendix E  
Online Reading Comprehension Protocols and Evaluation Rubrics

**ORCA- Blog Evaluation Rubric**

**FINAL ASSESSMENT - IMMEDIATE SCORING PROTOCOL**

|          |         |
|----------|---------|
| STUDENT: | SCORER: |
|----------|---------|

There are three tasks and blog postings. You will score each and then provide a partial and total score for each student while they complete the task. Add notes when you see important things happen. Record scores on the master score sheet.

|                      |
|----------------------|
| Begin Time/End Time: |
|----------------------|

**TASK 1: Use a search engine to locate two sites given partial information about each. Choose the best one, given two criteria, and explain why.**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b><u>(NEED HELP #1) Searching and Communicating</u></b></p> <p style="text-align: right; color: purple; font-weight: bold; font-size: 1.2em;">DRAFT</p> <p><b>Searching and Locating Score: (3 possible)</b></p> <p>0 = <u>Unable to complete the task.</u> Could not conduct a search or attempted to complete the task without a search engine, typing in various URL's which led to irrelevant sites or nowhere.</p> <p>1 = <u>Queried a search engine</u> to generate search results, explored some of the search results, <i>but</i> did not locate either location.</p> <p>2 = <u>Queried a search engine</u> to generate search results, explored the search results, <i>and</i> <u>located one location</u>:</p> <ul style="list-style-type: none"> <li>• <i>Cardiovascular System</i> <b><u>OR</u></b></li> <li>• <i>Derry Cooperative School District Technology Integration – Human Body</i></li> </ul> <p>3 = <u>Queried a search engine</u> to generate search results, explored the search results, <i>and</i> <u>located both locations</u>:</p> <ul style="list-style-type: none"> <li>• <i>Cardiovascular System</i> <b><u>AND</u></b></li> <li>• <i>Derry Cooperative School District Technology Integration – Human Body</i></li> </ul> <p><u>Successful task completion.</u></p> | <p><b>Searching and Locating Score:</b></p> <p><b>Note: To locate a site, students must demonstrate that they know they have located a site that met the task requirements by including it in the blog comment, saying they found it, or otherwise demonstrating that they know they have found a site.</b></p> <div style="border: 1px solid black; width: 40px; float: right; text-align: center; padding: 5px;">/3</div> |
| <p><b>Communicating Score: (4 possible)</b></p> <p>0 = <u>Unable to post the address for either site.</u> Did not make a blog entry. Could not figure it out, never got to this, or skipped this part of the task.</p> <p>1 = Included <u>one element</u> in the blog: an address or a title.</p> <p>2 = Included <u>two elements</u> in the blog: two titles, two addresses, or a title and an address.</p> <p>3 = Included <u>three elements</u> in the blog: two titles and one address or two addresses and one title.</p> <p>4 = Provided all four requested elements in the blog: two titles and two addresses.</p> <p><u>Successful task completion.</u></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p><b>Communicating:</b></p> <p><b>Note: Give credit if the URL is posted In the URL window, and not the comment Window, but subtract .5 from the score. If the student posted in the URL box twice, then subtract .5 twice.</b></p> <div style="border: 1px solid black; width: 40px; float: right; text-align: center; padding: 5px;">/4</div>                                                                            |

Appendix E  
Online Reading Comprehension Protocols and Evaluation Rubrics

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>(NEED HELP #2)</b></p> <p><b>Communicating Score: (2 possible)</b></p> <p>0 = <u>Unable to complete the task.</u> Did not make a blog entry. Could not figure it out, never got to this, or skipped this part of the task.</p> <p>1 = Chose the Human Anatomy site as the best site and provided reasons why.</p> <p>2 = Included <u>only the name or only the address</u> of the best site in the blog</p> <ul style="list-style-type: none"> <li>• Derry Cooperative School District Technology Integration – Human Body <b>OR</b></li> <li>• <a href="http://www.derry.k12.nh.us/teachers/techintegration/curriculum/science/humanbody.htm">http://www.derry.k12.nh.us/teachers/techintegration/curriculum/science/humanbody.htm</a></li> </ul> <p>3 = Included <u>both</u> the name and the address of the best site in the blog:</p> <ul style="list-style-type: none"> <li>• Derry Cooperative School District Technology Integration – Human Body <b>AND</b></li> <li>• <a href="http://www.derry.k12.nh.us/teachers/techintegration/curriculum/science/humanbody.htm">http://www.derry.k12.nh.us/teachers/techintegration/curriculum/science/humanbody.htm</a></li> </ul> | <p><b>Communicating Score:</b></p> <p><b>Note: Give credit if the URL is posted In the URL window, and not the comment Window, but subtract .5 from the score.</b></p> <div style="border: 1px solid black; width: 40px; float: right; text-align: center; padding: 5px;">/3</div> |
| <p><b>Evaluation Score: (2 possible)</b></p> <p>0 = <u>Unable to complete the task.</u> Did not make a blog entry. Could not figure it out, never got to this, or skipped this part of the task.</p> <p>1 = <u>Provided a partial explanation</u> of why they think this is the best site (e.g., <i>It's a good site. It's the best site. It doesn't have ads. It has lots of information.</i>).</p> <p>2 = <u>Provided a complete explanation</u> of why they think this is the best site (e.g., <i>It doesn't have ads AND it has lots of information.</i>).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p><b>Evaluation Score:</b></p> <div style="border: 1px solid black; width: 40px; float: right; text-align: center; padding: 5px;">/2</div> <div style="border: 1px solid black; width: 100px; float: right; text-align: center; padding: 5px;">/12</div>                          |
| <p><b>TOTAL POSSIBLE = 12 POINTS</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p><b>T1</b></p>                                                                                                                                                                                                                                                                   |

Appendix E  
Online Reading Comprehension Protocols and Evaluation Rubrics

**TASK 2: Use a search engine to locate an “animated graphic” about digestion that meets these criteria**

- a) Provides accurate information
- b) Does not contain any advertisements
- c) Is good for a 7<sup>th</sup> grade class.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Searching and Locating Score: (5 possible)</b></p> <p>0 = <u>Unable to complete the task.</u> Could not conduct a search or attempted to complete the task without a search engine, typing in various URL’s which led to irrelevant sites or nowhere.</p> <p>1 = <u>Queried a search engine</u> to generate search results, explored some of the search results, <u>but did not locate a graphic</u> of any type.</p> <p>2 = <u>Queried a search engine</u> to generate search results, explored the search results, <u>and located only one graphic</u> that did not fit the criteria (i.e., it had ads or was too hard for 7<sup>th</sup> graders).</p> <p>3. = <u>Queried a search engine</u> to generate search results, explored the search results, <u>and located several graphics</u> so that an evaluation across items could be made but selected one that did not meet all the criteria.</p> <p>4 = <u>Queried a search engine</u> to generate search results, explored the search results, <u>and located only one graphic</u>, but it met all the criteria. <u>Successful task completion.</u></p> <p>5 = <u>Queried a search engine</u> to generate search results, explored the search results, <u>and located several graphics</u> so that an evaluation across items could be made and then selected one that met all the criteria. <u>Successful task completion.</u></p> | <p><b>Searching and Locating Score:</b></p> <p><b>Note: To locate a site, students must demonstrate that they know they have located a site that met the task requirements by including it in the blog comment, saying they found it, or otherwise demonstrate that they know they have found a site.</b></p> <p><b>Note: Subtract .5 from any score if the student found a graphic but it was not animated.</b></p> <div style="border: 1px solid black; text-align: center; width: 50px; float: right; margin-top: -40px;">/5</div> |
| <p><b>Communicating Score: (3 possible)</b></p> <p>0 = <u>Unable to post the address for a site.</u> Did not make a blog entry. Could not figure it out, never got to this, or skipped this part of the task.</p> <p>1 = Included <u>one element</u> in the blog: an address , a title, <b>OR</b> information on how to check for accuracy.</p> <p>2 = Included <u>two elements</u> in the blog: an address , a title, <b>OR</b> information on how to check for accuracy.</p> <p>3 = Included all three elements in the blog: an address , a title, <b>AND</b> information on how to check for accuracy. <u>Successful task completion.</u></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p><b>Communicating Score:</b></p> <p><b>Note: Give credit if the URL is posted In the URL window, and not the comment Window, but subtract .5 from the score.</b></p> <div style="border: 1px solid black; text-align: center; width: 50px; float: right; margin-top: -40px;">/3</div>                                                                                                                                                                                                                                               |
| <p><b>Evaluation Score: (2 possible)</b></p> <p>0 = <u>Unable to complete the task.</u> Did not make a blog entry. Could not figure it out, never got to this, or skipped this part of the task.</p> <p>1 = Included information on how to check for accuracy but provided only a <u>simple strategy</u>. (e.g., I have been here before, a company would not post false information, etc..)</p> <p>2 = Included information on how to check information accuracy and it provides a <u>richer strategy</u>. (e.g., there is information about the person/organization/company and I trust that.)</p> <p><b>(Note: Please record here the strategy the student provided. we will read all of these entries and develop a list of responses that fit into each of these two categories. Just score it the best that you can for now.)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p><b>Evaluation Score:</b></p> <div style="border: 1px solid black; text-align: center; width: 50px; float: right; margin-top: -40px;">/2</div>                                                                                                                                                                                                                                                                                                                                                                                      |
| <p><b>TOTAL POSSIBLE = 10 POINTS</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p><b>T2</b></p> <div style="border: 1px solid black; text-align: center; width: 50px; float: right; margin-top: -40px;">/10</div>                                                                                                                                                                                                                                                                                                                                                                                                    |

Appendix E  
Online Reading Comprehension Protocols and Evaluation Rubrics

**TASK 3: Use a search engine to locate an animation about respiration that meets these criteria**

- a) Provides accurate information
- b) Does not contain any advertisements
- c) Is good for a 7<sup>th</sup> grade class.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Searching and Locating Score: (5 possible)</b></p> <p>0 = <u>Unable to complete the task.</u> Could not conduct a search or attempted to complete the task without a search engine, typing in various URL's which led to irrelevant sites or nowhere.</p> <p>1 = <u>Queried a search engine</u> to generate search results, explored some of the search results, <u>but did not locate a graphic</u> of any type.</p> <p>2 = <u>Queried a search engine</u> to generate search results, explored the search results, <u>and located only one graphic</u> that did not fit the criteria (i.e., it had ads or was too hard for 7<sup>th</sup> graders).</p> <p>3 = <u>Queried a search engine</u> to generate search results, explored the search results, <u>and located several graphics</u> so that an evaluation across items could be made but selected one that did not meet all the criteria.</p> <p>4 = <u>Queried a search engine</u> to generate search results, explored the search results, <u>and located only one graphic</u>, but it met all the criteria. <u>Successful task completion.</u></p> <p>5 = <u>Queried a search engine</u> to generate search results, explored the search results, <u>and located several graphics</u> so that an evaluation across items could be made and then selected one that met all the criteria. <u>Successful task completion.</u></p> | <p><b>Searching and Locating Score:</b></p> <p><b>Note: To locate a site, students must demonstrate that they know they have located a site that met the task requirements by including it in the blog comment, saying they found it, or otherwise demonstrating that they know they have found a site.</b></p> <p><b>Note: Subtract .5 from any score if the student found a graphic but it was not animated.</b></p> <div style="border: 1px solid black; text-align: center; width: 50px; float: right; margin-top: -40px;">/5</div> |
| <p><b>Communicating Score: (3 possible)</b></p> <p>0 = <u>Unable to post the address for a site.</u> Did not make a blog entry. Could not figure it out, never got to this, or skipped this part of the task.</p> <p>1 = Included <u>one element</u> in the blog: an address , a title, <b>OR</b> information on how to check for accuracy.</p> <p>2 = Included <u>two elements</u> in the blog: an address , a title, <b>OR</b> information on how to check for accuracy.</p> <p>3 = Included all three elements in the blog: an address , a title, <b>AND</b> information on how to check for accuracy. <u>Successful task completion.</u></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p><b>Communicating Score:</b></p> <p><b>Note: Give credit if the URL is posted In the URL window, and not the comment window, but subtract .5 from the score.</b></p> <div style="border: 1px solid black; text-align: center; width: 50px; float: right; margin-top: -40px;">/3</div>                                                                                                                                                                                                                                                 |
| <p><b>Evaluation Score: (2 possible)</b></p> <p>0 = <u>Unable to complete the task.</u> Did not make a blog entry. Could not figure it out, never got to this, or skipped this part of the task.</p> <p>1 = Included information on how to check for accuracy but provided only a <u>simple strategy</u>. (e.g., I have been here before, a company would not post false information, etc..)</p> <p>2 = Included information on how to check information accuracy and it provides a <u>richer strategy</u>. (e.g., there is information about the person/organization/company and I trust that.)</p> <p><b>(Note: Please record here the strategy the student provided. we will read all of these entries and develop a list of responses that fit into each of these two categories. Just score it the best that you can for now.)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p><b>Evaluation Score:</b></p> <div style="border: 1px solid black; text-align: center; width: 50px; float: right; margin-top: -40px;">/2</div>                                                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>TOTAL POSSIBLE = 10 POINTS</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p><b>T3</b></p> <div style="border: 1px solid black; text-align: center; width: 50px; float: right; margin-top: -40px;">/10</div>                                                                                                                                                                                                                                                                                                                                                                                                      |

TOTAL FOR ALL TASKS:

|                                                                                                |                                                                                                |                                                                                                |                                                                                                |                                                                                                |                                                                                                |                                                                                                |                                                                                                |                                                                                                |                                                                                                |                                                                                                |                                                                                                |                                                                                                |
|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> | <div style="border: 1px solid black; width: 40px; height: 40px; display: inline-block;"></div> |
| SL1                                                                                            | C1A                                                                                            | C1B                                                                                            | E1                                                                                             | T1                                                                                             | SL2                                                                                            | C2                                                                                             | E2                                                                                             | T2                                                                                             | SL3                                                                                            | C3                                                                                             | E3                                                                                             | T3                                                                                             |



Appendix E  
*Online Reading Comprehension Protocols and Evaluation Rubrics*

(3) (4) (3) (2) (12) (5) (3) (2) (10) (5) (3) (2) (10)

Student Name:

TOTAL = /32

DRAFT

# Appendix F

## ORCA- Blog Inter-Rater Reliability Comparisons

| Student            | Group  | SL<br>1<br>(3) | C1<br>A<br>(4) | C1B<br>(3) | E1<br>(2) | T1<br>(12) | SL2<br>(5) | C2<br>(3) | E2<br>(2) | T2<br>(10) | SL<br>(3) | C3<br>(3) | E3<br>(2) | T3<br>(10) | Total<br>(32) |
|--------------------|--------|----------------|----------------|------------|-----------|------------|------------|-----------|-----------|------------|-----------|-----------|-----------|------------|---------------|
| Joe (Rater #1)     | NoIRT  | 3              | 1              | 1          | 1         | 6          | 3.5        | 0         | 0         | 3.5        | 3.5       | 2         | 0         | 5.5        | 15            |
| Joe (Rater #2)     | NoIRT  | 3              | 1              | 1          | 1         | 6          | 3.5        | 0         | 0         | 3.5        | 3.5       | 2         | 0         | 5.5        | 15            |
| % Agreement        |        | 100            | 100            | 100        | 100       | NA         | 100        | 100       | 100       | NA         | 100       | 100       | 100       | NA         | 100           |
| Jillian (Rater #1) | NoIRT  | 3              | 2              | 0          | 0         | 5          | 4          | 2         | 2         | 8          | 3.5       | 2         | 2         | 7.5        | 20.5          |
| Jillian (Rater #2) | NoIRT  | 3              | 2              | 0          | 0         | 5          | 4          | 2         | 2         | 8          | 3.5       | 2         | 2         | 7.5        | 20.5          |
| % Agreement        |        | 100            | 100            | 100        | 100       | NA         | 100        | 100       | 100       | NA         | 100       | 100       | 100       | NA         | 100           |
| Ryan (Rater #1)    | NoIRT  | 3              | 4              | 1          | 2         | 10         | 4          | 3         | 2         | 9          | 0         | 0         | 0         | 0          | 19            |
| Ryan (Rater #2)    | NoIRT  | 3              | 4              | 1          | 2         | 10         | 4          | 3         | 2         | 9          | 0         | 0         | 0         | 0          | 19            |
| % Agreement        |        | 100            | 100            | 100        | 100       | NA         | 100        | 100       | 100       | NA         | 100       | 100       | 100       | NA         | 100           |
| Britt (Rater #1)   | NoIRT  | 3              | 4              | 3          | 2         | 12         | 0          | 0         | 0         | 0          | 4         | 3         | 2         | 9          | 21            |
| Britt(Rater #2)    | NoIRT  | 3              | 4              | 3          | 2         | 12         | 0          | 0         | 0         | 0          | 4         | 3         | 2         | 9          | 21            |
| % Agreement        |        | 100            | 100            | 100        | 100       | NA         | 100        | 100       | 100       | NA         | 100       | 100       | 100       | NA         | 100           |
| Lauren (Rater#1)   | NoIRT  | 2              | 1              | 0          | 2         | 5          | 2          | 0         | 0         | 2          | 0         | 0         | 0         | 0          | 8             |
| Lauren (Rater#2)   | NoIRT  | 2              | 1              | 0          | 2         | 5          | 2          | 0         | 0         | 2          | 0         | 0         | 0         | 0          | 8             |
| % Agreement        |        | 100            | 100            | 100        | 100       | NA         | 100        | 100       | 100       | NA         | 100       | 100       | 100       | NA         | 100           |
| Dan (Rater #1)     | Cont   | 3              | 4              | 2          | 2         | 11         | 0          | 0         | 0         | 0          | 0         | 0         | 0         | 0          | 11            |
| Dan (Rater #2)     | Cont   | 3              | 4              | 2          | 2         | 11         | 0          | 0         | 0         | 0          | 0         | 0         | 0         | 0          | 11            |
| % Agreement        |        | 100            | 100            | 100        | 100       | NA         | 100        | 100       | 100       | NA         | 100       | 100       | NA        | 100        | 100           |
| Haley (Rater #1)   | Cont   | 1              | 0              | 0          | 0         | 1          | 2          | 0         | 0         | 2          | 0         | 0         | 0         | 0          | 3             |
| Haley (Rater #2)   | Cont   | 1              | 0              | 0          | 0         | 1          | 2          | 0         | 0         | 2          | 0         | 0         | 0         | 0          | 3             |
| % Agreement        |        | 100            | 100            | 100        | 100       | NA         | 100        | 100       | 100       | NA         | 100       | 100       | 100       | NA         | 100           |
| Brian (Rater #1)   | Cont   | 3              | 4              | 2          | 2         | 11         | 5          | 3         | 2         | 10         | 3.5       | 3         | 1         | 7.5        | 28.5          |
| Brian (Rater #2)   | Cont   | 3              | 4              | 2          | 2         | 11         | 5          | 3         | 2         | 10         | 3.5       | 3         | 2         | 8.5        | 29.5          |
| % Agreement        |        | 100            | 100            | 100        | 100       | NA         | 100        | 100       | 100       | NA         | 100       | 100       | 0         | NA         | 90%           |
| Tyler (Rater #1)   | Cont   | 1              | 0              | 0          | 0         | 1          | 1          | 0         | 0         | 1          | 1         | 0         | 0         | 1          | 3             |
| Tyler (Rater #2)   | Cont   | 1              | 0              | 0          | 0         | 1          | 1          | 0         | 0         | 1          | 1         | 0         | 0         | 1          | 3             |
| % Agreement        |        | 100            | 100            | 100        | 100       | NA         | 100        | 100       | 100       | NA         | 100       | 100       | 100       | NA         | 100           |
| Stacy (Rater #1)   | Cont   | 3              | 2              | 2          | 2         | 9          | 4.5        | 2         | 2         | 8.5        | 3         | 1         | 0         | 4          | 21.5          |
| Stacy (Rater #2)   | Cont   | 3              | 2              | 2          | 2         | 9          | 4.5        | 3         | 2         | 9.5        | 3         | 1         | 0         | 4          | 22.5          |
| % Agreement        |        | 100            | 100            | 100        | 100       | NA         | 100        | 0         | 100       | NA         | 100       | 100       | 100       | NA         | 90%           |
| John (Rater #1)    | IRT Ex | 2              | 2              | 0          | 0         | 4          | 3.5        | 1         | 0         | 4.5        | 3.5       | 3         | 1         | 7.5        | 16            |

## Appendix F

### ORCA- Blog Inter-Rater Reliability Comparisons

|                  |         |     |     |     |     |    |     |     |     |     |     |     |     |     |      |
|------------------|---------|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| John (Rater #2)  | IRT Ex  | 2   | 2   | 0   | 0   | 4  | 3.5 | 1   | 0   | 4.5 | 3.5 | 3   | 1   | 7.5 | 16   |
| % Agreement      |         | 100 | 100 | 100 | 100 | NA | 100 | 100 | 100 | NA  | 100 | 100 | 100 | NA  | 100  |
| Ally (Rater #1)  | IRT Ex  | 3   | 2   | 2   | 2   | 9  | 3   | 1   | 0   | 4   | 0   | 0   | 0   | 0   | 13   |
| Ally (Rater #2)  | IRT Ex  | 3   | 2   | 2   | 2   | 9  | 3   | 1   | 0   | 4   | 0   | 0   | 0   | 0   | 13   |
| % Agreement      |         | 100 | 100 | 100 | 100 | NA | 100 | 100 | 100 | NA  | 100 | 100 | 100 | NA  | 100  |
| Dave (Rater #1)  | IRT Ex  | 3   | 2   | 2   | 1   | 8  | 4   | 3   | 2   | 9   | 4.5 | 2   | 2   | 8.5 | 25.5 |
| David (Rater #2) | IRT Ex  | 3   | 2   | 2   | 1   | 8  | 4   | 3   | 2   | 9   | 4.5 | 2   | 2   | 8.5 | 25.5 |
| % Agreement      |         | 100 | 100 | 100 | 100 | NA | 100 | 100 | 100 | NA  | 100 | 100 | 100 | NA  | 100  |
| Ryan (Rater #1)  | IRT Ex  | 3   | 2   | 1   | 1   | 7  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 7    |
| Ryan (Rater #2)  | IRT Ex  | 3   | 2   | 1   | 1   | 7  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 7    |
| % Agreement      |         | 100 | 100 | 100 | 100 | NA | 100 | 100 | 100 | NA  | 100 | 100 | 100 | NA  | 100  |
| Matt (Rater #1)  | IRT Reg | 3   | 3   | 0   | 0   | 6  | 3.5 | 3   | 1   | 7.5 | 3.5 | 3   | 2   | 8.5 | 22   |
| Matt (Rater #2)  | IRT Reg | 3   | 3   | 0   | 0   | 6  | 3.5 | 3   | 1   | 7.5 | 3.5 | 3   | 2   | 8.5 | 22   |
| % Agreement      |         | 100 | 100 | 100 | 100 | NA | 100 | 100 | 100 | NA  | 100 | 100 | 100 | NA  | 100  |
| Devin (Rater #1) | IRT Reg | 3   | 4   | 3   | 2   | 12 | 4   | 3   | 2   | 9   | 3.5 | 3   | 2   | 8.5 | 29.5 |
| Devin (Rater #2) | IRT Reg | 3   | 4   | 3   | 2   | 12 | 4   | 3   | 2   | 9   | 3.5 | 3   | 2   | 8.5 | 29.5 |
| % Agreement      |         | 100 | 100 | 100 | 100 | NA | 100 | 100 | 100 | NA  | 100 | 100 | 100 | NA  | 100  |
| Andy (Rater #1)  | IRT Reg | 1   | 0   | 0   | 0   | 1  | 3.5 | 0   | 0   | 3.5 | 3.5 | 0   | 0   | 3.5 | 8    |
| Andy (Rater #2)  | IRT Reg | 1   | 0   | 0   | 0   | 1  | 3.5 | 0   | 0   | 3.5 | 3.5 | 0   | 0   | 3.5 | 8    |
| % Agreement      |         | 100 | 100 | 100 | 100 | NA | 100 | 100 | 100 | NA  | 100 | 100 | 100 | NA  | 100  |
| Haley (Rater #1) | IRT Reg | 3   | 3   | 1   | 1   | 8  | 4   | 2.5 | 1   | 7.5 | 2   | 0   | 0   | 2   | 17.5 |
| Haley (Rater #2) | IRT Reg | 3   | 3   | 1   | 1   | 8  | 4   | 2.5 | 1   | 7.5 | 2   | 0   | 0   | 2   | 17.5 |
| % Agreement      |         | 100 | 100 | 100 | 100 | NA | 100 | 100 | 100 | NA  | 100 | 100 | 100 | NA  | 100  |
| TOTAL AGREEMENT  |         | 100 | 100 | 100 | 100 | NA | 100 | 94  | 100 | NA  | 100 | 100 | 94  | NA  | 98   |

Appendix G  
Human Body Systems Quizzes

Name \_\_\_\_\_ Date \_\_\_\_\_

## Circulatory System Quiz

1) Complete the following paragraph that explains the path blood takes as it flows throughout the body. Use the word bank to fill in the blanks.

|           |                                                                                                                    |
|-----------|--------------------------------------------------------------------------------------------------------------------|
| Word Bank | arteries, capillaries, right ventricle, left ventricle, oxygen, veins, lungs (one of these words will not be used) |
|-----------|--------------------------------------------------------------------------------------------------------------------|

The heart is a specialized muscle that pumps blood through the blood vessels to all parts of the body. The \_\_\_\_\_ of the heart brings blood in from the body and pumps it to the lungs. In the \_\_\_\_\_, the blood cells exchange gaseous wastes for \_\_\_\_\_. Then the blood returns back to the heart, where it is pumped back out to the body. Three types of blood vessels - arteries, veins, and capillaries - transport blood around the body. \_\_\_\_\_ carry blood away from the heart. \_\_\_\_\_ carry blood back to the heart. The smallest blood vessels, the \_\_\_\_\_, are the place where oxygen is provided to the cells and exchanged for carbon dioxide.

2) In the diagram on the overhead, show which of the large blood vessels labeled *a, b, c*, and *d* are arteries and which are veins? Write your answer on the line next to the appropriate letter.

*a* \_\_\_\_\_

*b* \_\_\_\_\_

*c* \_\_\_\_\_

*d* \_\_\_\_\_

Appendix G  
Human Body System Quizzes

*For questions 3-6, circle the correct answer.*

- 2) The largest artery in the body is called the
  - a. coronary artery.
  - b. atrium.
  - c. capillary.
  - d. aorta.
- 3) A blood vessel that carries oxygen-rich blood to the heart muscle is called a(n)
  - a. coronary artery.
  - b. vein.
  - c. ventricle.
  - d. atrium.
- 4) Which of the following is NOT a characteristic of a vein?
  - a. valves prevent backward flow of blood.
  - b. returns blood to the heart.
  - c. walls are one cell thick.
  - d. contracts to push blood along.
- 5) Which of the following structures pumps blood into arteries leading to the lungs?
  - a. right atrium.
  - b. left atrium.
  - c. right ventricle.
  - d. left ventricle.

*Fill in the blank.*

- 6) \_\_\_\_\_ is a waxy, fat-like substance that can build up in arteries.
- 7) The tiny vessels where oxygen moves from the red blood cells into the body cells are called \_\_\_\_\_.

*If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.*

- \_\_\_\_\_ 9) White blood cells defend the body against disease.
  - \_\_\_\_\_ 10) The force of the heart's contracting atria causes blood pressure.
  - \_\_\_\_\_ 11) Valves in the heart help control the direction of blood flow.
  - \_\_\_\_\_ 12) Capillary walls must be very thick to withstand the high force of blood pumped by the heart.
-

Appendix G  
Human Body System Quizzes

*Use the word bank to label the heart diagram below.*

**WORD BANK:**

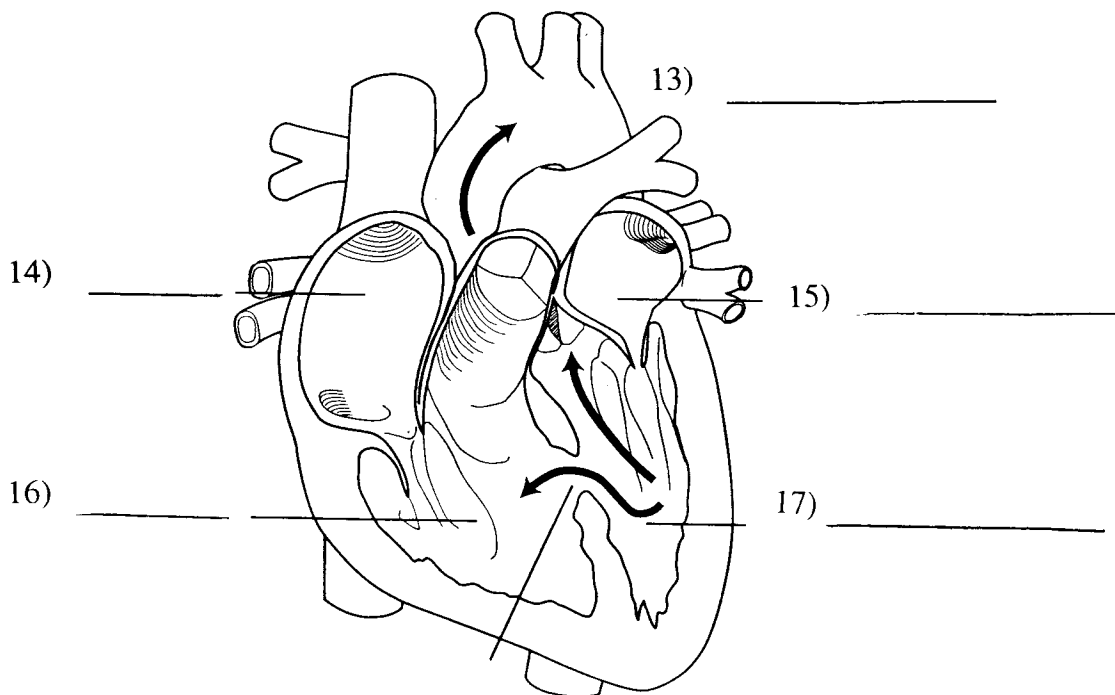
Right atrium

Left atrium

Right ventricle

Left ventricle

Aorta



Appendix G  
Human Body Systems Quizzes

Name \_\_\_\_\_

Date \_\_\_\_\_

Respiratory System Quiz

Complete the following paragraph that explains the path air takes as it moves through the respiratory system. Use the word bank to fill in the blanks. Two words will not be used.

|                                                                                     |
|-------------------------------------------------------------------------------------|
| Carbon dioxide, lungs, trachea, oxygen, bronchi, alveoli, pharynx, larynx, nostrils |
|-------------------------------------------------------------------------------------|

The respiratory system moves \_\_\_\_\_ from the outside environment into the body. It also removes \_\_\_\_\_ and water from the body. Air enters the body through the \_\_\_\_\_, then downward into the top of the throat, or \_\_\_\_\_. From there, the \_\_\_\_\_, or windpipe, leads to the lungs. Air then moves into the right and left \_\_\_\_\_, which are passages that direct air into the lungs. The \_\_\_\_\_ are the main organs of the respiratory system.

*For questions 3-6, circle the best answer.*

- 2) The large, dome-shaped muscle at the base of the lungs is called the
  - a. cilia
  - b. diaphragm
  - c. vocal cords
  - d. larynx
  
- 3) During breathing, the alveoli and the capillaries exchange these two gasses.
  - a. water and oxygen.
  - b. water and carbon dioxide.
  - c. carbon dioxide and oxygen.
  - d. helium and krypton.

Appendix G  
Human Body Systems Quizzes

- 4) Which of the following is NOT a function of mucus?
- a. It regulates the air you breathe.
  - b. It warms the air you breathe.
  - c. It cleans the air you breathe.
  - d. It moisturizes the air you breathe.
- 5) The sac of lung tissue where gas exchange takes place is called
- a. diaphragm
  - b. bronchi
  - c. lungs
  - d. alveoli

*Fill in the blank.*

- 6) \_\_\_\_\_ are tiny hair-like extensions that germs and other particles.
- 7) \_\_\_\_\_ is also known as the voice box.

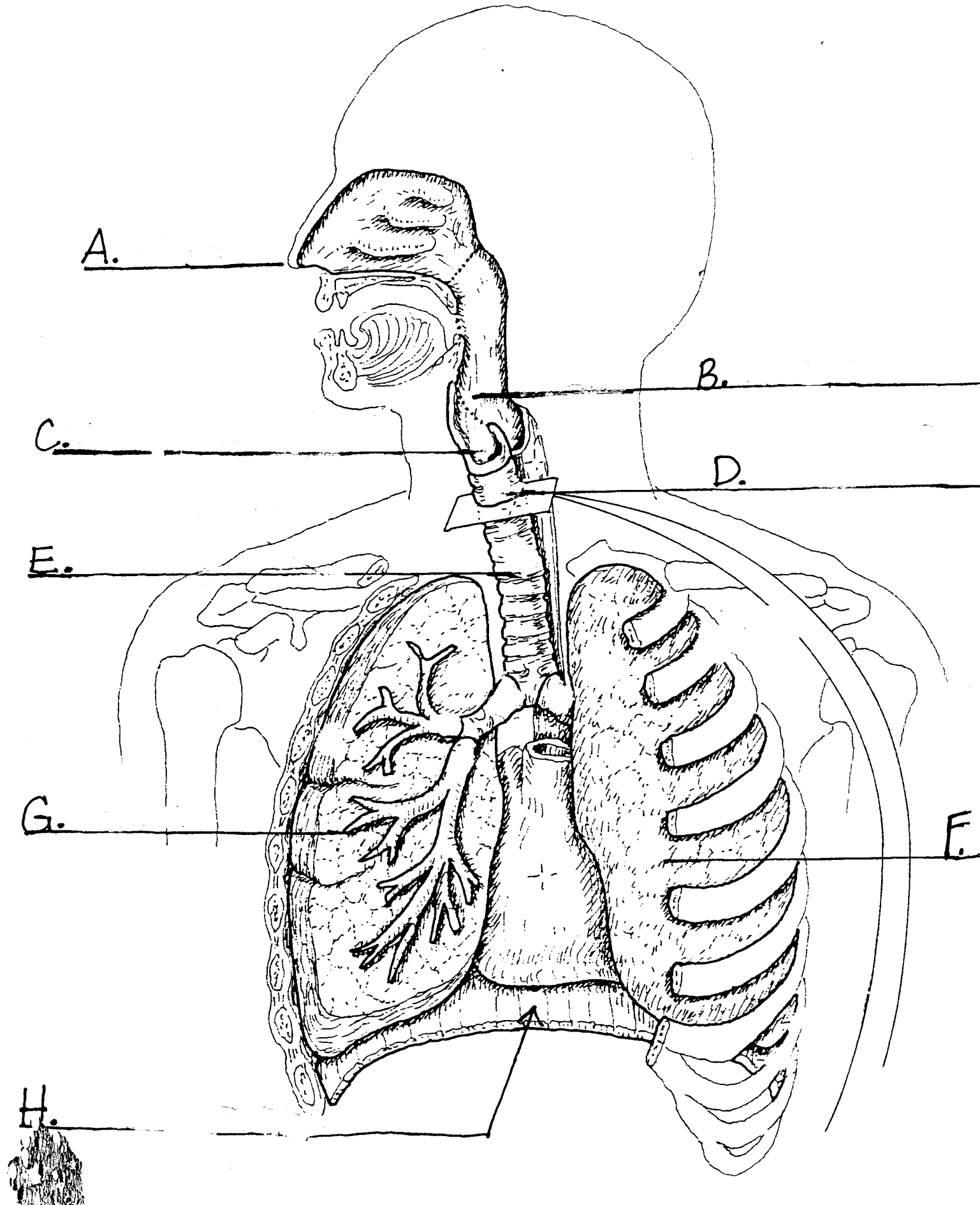
*If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.*

- \_\_\_\_\_ 9) The pharynx is a flap of tissue that closes off the and windpipe and prevents food from entering it.
- \_\_\_\_\_ 10) Alveoli are surrounded by capillaries.
- \_\_\_\_\_ 11) The diaphragm and bronchi make the chest cavity expand when you inhale and contract when you exhale.
- \_\_\_\_\_ 12) The walls of the trachea are made of tissue of cartilage to keep it from collapsing.
- \_\_\_\_\_ 13) Respiration is a chemical reaction that combines glucose and oxygen to produce energy for the body's cells.
- \_\_\_\_\_ 14) The alveoli is a good place for gas exchange to occur because it has a large surface area.



Appendix G  
Human Body Systems Quizzes

*Label the parts of the respiratory system below. (There are 8 blanks)*



Appendix G  
Human Body System Quizzes

Name:  
Period:  
Date:

Digestive System Quiz

1.) Complete the following paragraph on the digestive process. Use the word bank to fill in the blanks. Two words will not be used.

**Word Bank: stomach, small intestines, enzymes, digestion, large intestines, water, wastes, absorption, esophagus, peristalsis, liver, mouth**

The process by which the body breaks down food into small nutrient molecules is called \_\_\_\_\_. After food is digested, the molecules are ready to be transported throughout your body. \_\_\_\_\_ is the process by which nutrient molecules pass through the wall of your digestive system into your blood. Materials that are not absorbed, such as fiber, are eliminated by your body as \_\_\_\_\_. Chemical digestion is accomplished by \_\_\_\_\_, proteins that speed up chemical reactions in the body. As you swallow, food moves into the \_\_\_\_\_, a muscular tube that connects the \_\_\_\_\_ to the stomach. Food then travels to the \_\_\_\_\_, where muscle contractions churn the food. Once the food has been digested into liquid form it travels to the \_\_\_\_\_, where most of the chemical digestion takes place. Now the liquid moves into the \_\_\_\_\_. Here \_\_\_\_\_ is absorbed into the bloodstream and the remaining material is ready for elimination from the body.

2.) Read the following phrases. Write “chemical” next to the phrase if it applies only to chemical digestion, “mechanical” next to the phrase if it applies only to mechanical digestion, and “both” next to the phrase if it applies to both chemical and mechanical digestion.

\_\_\_\_\_ Begins in the mouth  
\_\_\_\_\_ Accomplished by enzymes  
\_\_\_\_\_ Teeth break food into smaller pieces  
\_\_\_\_\_ Occurs in the stomach

Appendix G  
Human Body System Quizzes

*For questions 3-6, circle the best answer*

- 3.) Involuntary waves of muscle contractions that move food down the esophagus towards the stomach are called
- a.) peristalsis
  - b.) mechanical digestion
  - c.) chemical digestion
  - d.) muscle spasms
- 4.) Which of the following is NOT true about the digestive system?
- a.) It prevents molecules from being absorbed into the blood and carried throughout the body.
  - b.) Wastes are eliminated from the body.
  - c.) It breaks down food into molecules the body can use.
  - d.) The small intestines make up 2/3 of the digestive system
- 5.) The large intestines ends in a short tube called
- a.) anus
  - b.) bile
  - c.) rectum
  - d.) liver
- 6.) The stomach contains digestive juices, which is made of the following chemicals
- a.) trypsin and maltase
  - b.) hydrochloric acid and pepsin
  - c.) pepsin and lipase
  - d.) hydrochloric acid and bile

*Fill in the blank*

- 7.) The \_\_\_\_\_ seals off your windpipe, preventing food from entering.
- 8.) The lining of the small intestines is covered with millions of tiny finger-shaped structures called \_\_\_\_\_.

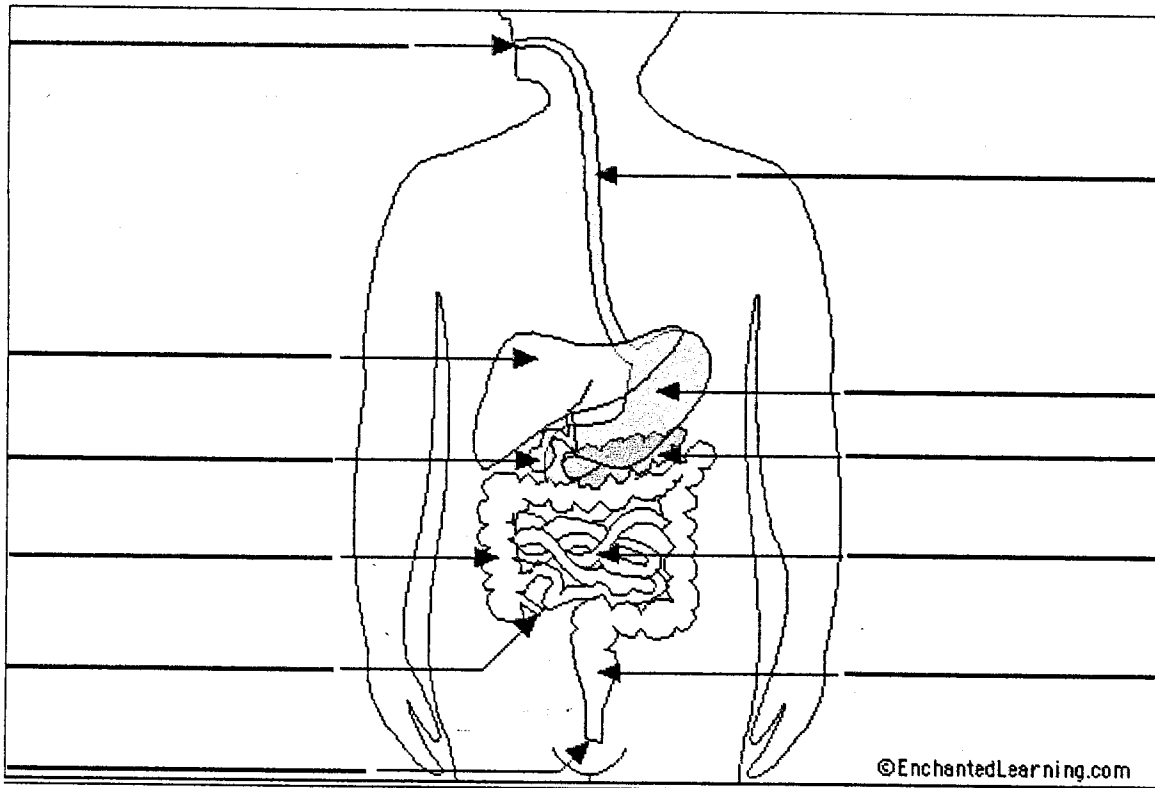
***If the statement is true write true. If it is false, change the underlined word or words to make the statement true.***

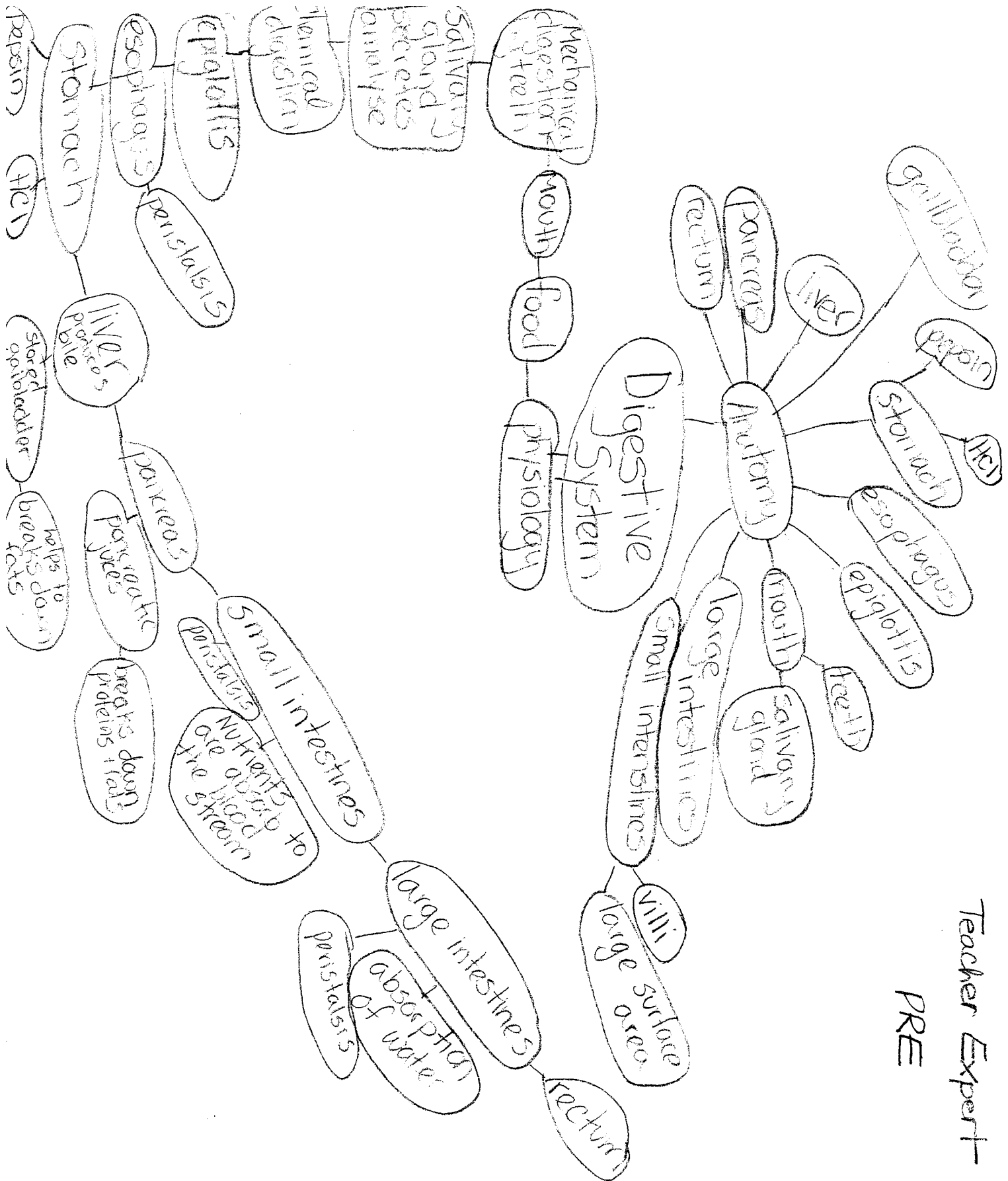
- \_\_\_\_\_ 9.) The liver produces bile, a substance that breaks up fat particles.
-

Appendix G  
Human Body System Quizzes

- \_\_\_\_\_ 10.) The pancreas produces enzymes that flow into the large  
intestines.
- \_\_\_\_\_ 11.) The lining of the small intestines is covered with millions  
of tiny finger-shaped structures called villi.

*Fill in the 11 blanks below.*

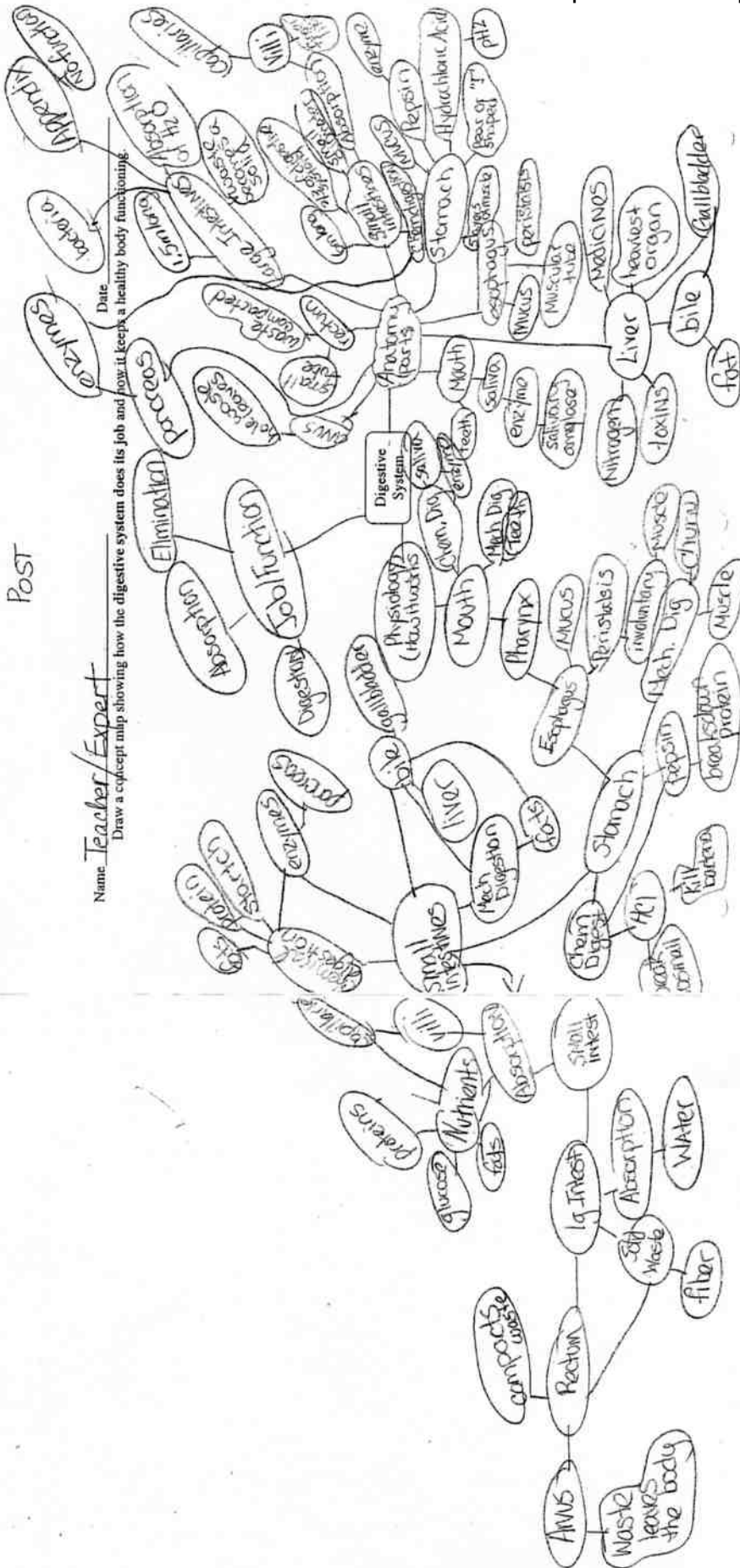




Teacher Expert-

PRE

Appendix H  
Annotated Examples of Concept Map Scoring



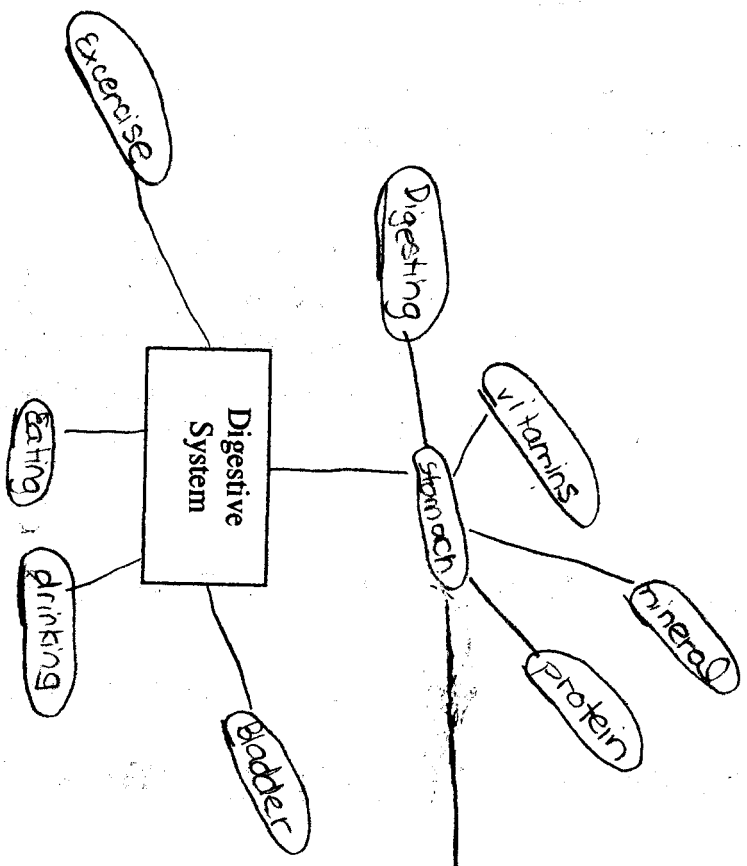
Name: \_\_\_\_\_

1RT 12 weeks stud id # 34101

Date: April 25, 2005

Draw a concept map showing how the digestive system does its job and how it keeps a healthy body functioning.

PRE

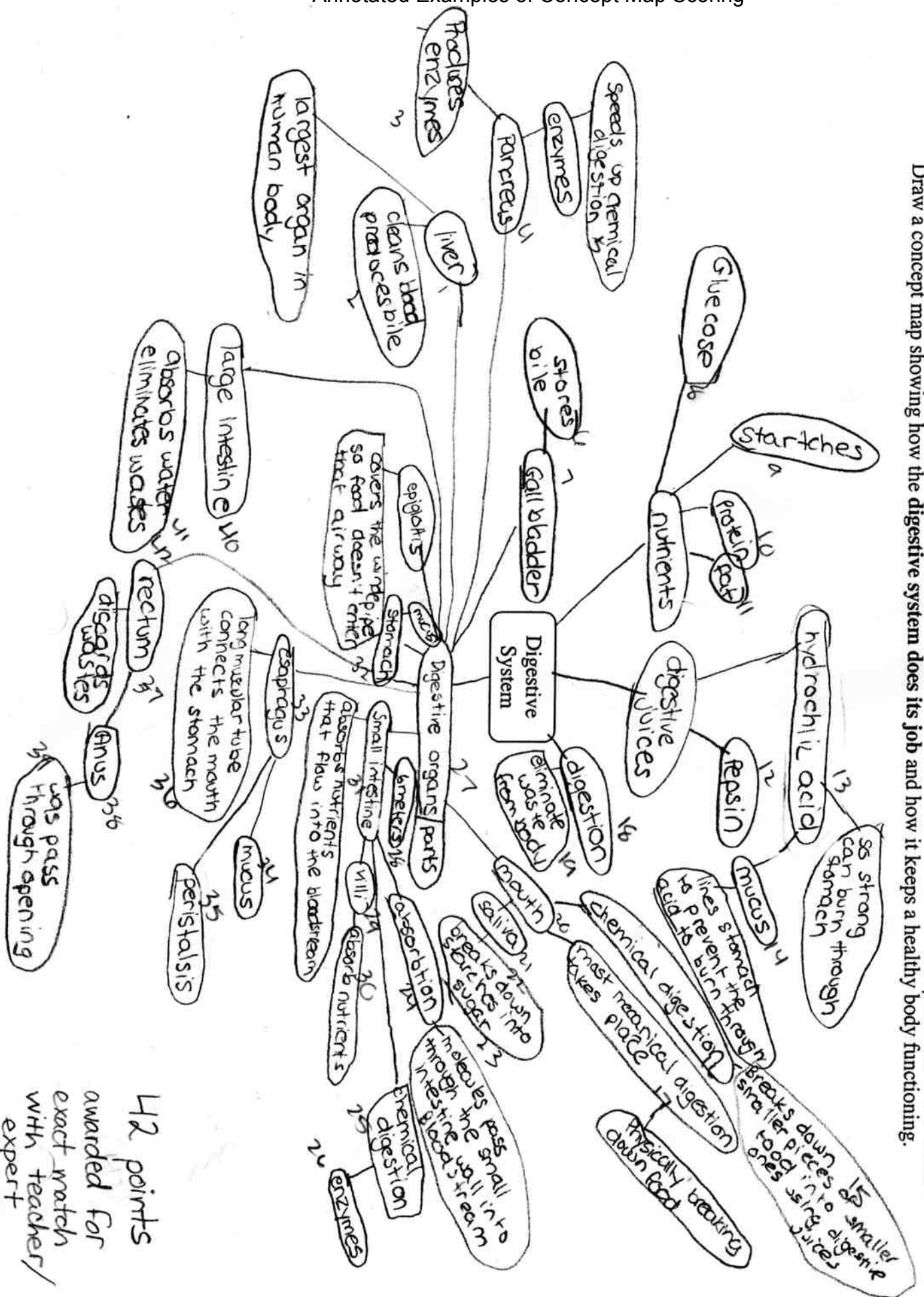


1 point  
awarded  
for exact  
match with  
teacher/expert

Name \_\_\_\_\_ RT 12 weeks stud id # 3401

Date Mon 16 Jan 2005

Draw a concept map showing how the digestive system does its job and how it keeps a healthy body functioning.



42 points  
awarded for  
exact match  
with teacher/  
expert