

# TE 846 Final Project: Two emerging Secondary Education Students

By David Crewes

Finding subjects for this study in the middle of summer has proven to be somewhat of a challenge. With the hectic schedules of teachers and students during summer vacation, my first subject and I had difficulties setting up meeting times. In retrospect, I think this was a positive development because it allowed me to evaluate another subject who is closer to my realm of teaching; that realm being secondary education. I struggled, at first, with this decision for a few reasons. The first was that they were *not* elementary school students. Most of the techniques and literature introduced in this class that we were utilize and support were geared toward the elementary school student, or emerging readers. Another reason for my apprehension was the fact that this subject was not developing the skills to be a successful reader and writer. She has already far exceeded grade expectations for reading comprehension and efficacy. The final reason for my indecision was that I felt that the lesson plans I had in place might not be able to show the improvement in student achievement that a lesson with emerging readers might show. In the end, I decided to continue with this study on the secondary subject, and try to introduce strategies of reading comprehension associated with such high stakes standardized tests as the ACT. (Standard II) It is those strategies that I try to introduce in my own classroom whenever the opportunity arises.

The name of my subject is Katie. I have known Katie her whole life, and while I have never had the chance to instruct Katie in my own classroom, I have had the opportunity to watch her grow into a very promising student. Katie is a caring, hard-working, personable, well-

mannered, helpful, 12 year-old. She is going to be in the 7<sup>th</sup> grade this year, and this is her 2<sup>nd</sup> year in middle school. Katie is a Caucasian of European descent, speaks only English and has no learning disabilities. In fact, she is enrolled in the Academically Talented (AT) program at her middle school. Last year, Katie received all A's on her report card and scored in the Advanced level on the Reading, Mathematics and Social Studies MEAP. It was for this reason that I have prepared lessons for Katie as I would have for a student who was enrolled in one of my 9<sup>th</sup> grade Earth Science classes. She may not be at a 9<sup>th</sup> level physiologically and behaviorally, but she is definitely at a 9<sup>th</sup> grade level academically. (Standard III)

The AT program that she is enrolled in offers "Classes ..... at an accelerated pace for students with the intellectual capacity and aptitude, rate of learning and potential for creative contributions that would excel under the challenge" (Website) This AT program utilizes many of the techniques that this class has introduced over the last 6 weeks. Katie's grades and performance speaks for itself. When Katie was younger she had some speech and reading difficulties and the AT instructors (Katie's older brother is also in the AT program) offered some suggestions based on Phonological Awareness. This type of instruction "has moderate and statistically significant effects on reading and spelling abilities and that explicit instruction is beneficial for typically developing children" (Francis, Anthony, 2005, pg 255). The traditional methods of her early grade school teachers did not seem to work for Katie. Her parents used the techniques involved in Phonological Awareness, and Katie was soon above grade level in reading and writing. (Standard I)

The material that I am incorporating into my lesson comes from the Earth Science book I use to teach Astronomy, Geology, and Weather and Climate. (Glencoe, 2002) I chose Section

one from Chapter 11. This section introduces the student to the atmosphere and the ideas of energy transfer from the sun. (HSCE's: E2.2a, E2.2c, E2.4c, E4.p2a) (Standard II) I would normally cover this material in a day or two, depending on how many activities I have scheduled, if we are on track, with respect to pacing, and of course student involvement. I tend to run my classroom in a relaxed manner, allowing students to ask questions when they want, contribute to a conversation at anytime, and laugh as much as possible. Sometimes the students have a lot to say and share, other times they sit and stare, allowing me to cover a large amount of material. I can never tell what type of day it will be. Since Katie is not in a classroom setting I decided that we should break up instruction into two days (parts). Each day consisted of three activities that supported the reading, vocabulary and the main ideas of the section. (Standard V and VI) My goals for these lessons are to have student comprehension of vocabulary words, and the ability for each student to correctly explain the concepts associated with energy transfer in the atmosphere.

I started this unit with a pre-reading quiz. It is actually a pre, and post, reading quiz. (Appendix A) The left side of the document has answer spaces for the pre reading assessment, while the right side of the document has answer spaces for the post reading assessment. Katie's first response when I handed her the quiz was, "WOW! You're giving me a quiz already? You are a hard teacher!" I reassured her by telling her that this was to gauge how much prerequisite knowledge of the atmosphere she had before we started the lesson. Then I would give her back the quiz after the lesson and she would answer the same questions again. This would hopefully show her improvement in the subject matter and can also be tied to her reading comprehension. The results of the pre-reading test were 37.5% (3/8) correct. This

definitely shows that Katie has some prerequisite knowledge, but there is still much more learning and comprehension to be done. (Standard III)

The next part of the lesson involved an activity on morphological knowledge and decoding. (Cunningham, 1998) Katie and I had a discussion about how some words are made up of other words. We talked a prefixes, roots, and suffixes as they pertained to taking a word apart. She told me, “My teacher taught us to take words apart if we didn’t understand them. It really helps if you come across words you don’t know as you are reading.” I mentioned that this method is called decoding, and it is a very useful tool in all of your classes, especially in the sciences. (Standard II) We talked about how the Greek and Latin languages are the origins of many of our words in the English language. At this point, it got a little silly and we veered off for a short time on a tangent of Pig Latin. After laughing and joking for a few moments, we returned to the topic of decoding, a bit lighter of heart. (Welcome to my classroom; laughter is a requirement!) I handed out some copies of common prefixes, suffixes and root words from the Latin and Greek languages, and instructed her on how to complete a morphological tree. She seemed to like this activity, as she dove right in, completing the first page (Appendix B) with no problems or guidance from myself. On the other two trees, (Appendix C and D) she was stuck a little and I allowed her to use the internet to finish the worksheet. She still couldn’t find one answer, and I informed her that this is about effort and contribution, not necessarily the “correct” answer. “Make an educated guess,” I told her. After she finished the worksheets, she asked to use the internet to find “better” examples. I told her, “Yes, but find *additional* examples. You should keep your originals, they’re great.” Since Katie is a perfectionist, off she went to the computer. I often allow variations of class work if the reasons are sound, and the

same effort and quality of work will be produced. For the most part, Katie's decoding of the three vocabulary words proved to be very good. I asked her whether the definitions that she developed made sense, to which she replied, "Kind of." I advised her to watch for these words in the reading to see if they make sense in context. She agreed that she would. Later, as Katie was reading the text, I heard her exclaim, "Oh! I get it!" I asked her to explain, and she told me the "mesosphere" was a middle ball, by her definition, but in actuality, it is the middle layer of five that make up the spherical atmosphere surrounding the Earth, or it's the middle ball-shaped layer of the atmosphere. One variation I could have used with the Morphology tree is to assign groups different words to decode, rather than an individual word for each student. Cooperative learning is a nice way to vary activities throughout a unit. (Standard IV)

The next activity I handed out to Katie was a QAR (Question and Answer Relationship) worksheet. I asked her if she had seen there before and she replied that she hadn't. This lesson is designed to assist in reading comprehension by having students recognize what *types* of questions the text can support. The readers are taught to use four types of question/answer relationships, along with their own background knowledge, to find the information they need. Katie and I reviewed the QAR flowchart (Appendix E), and then looked at a sample reading with 6 questions that followed the reading. I read the sample aloud, and Katie then correctly identified the types of questions, where she would look to find the answers, and the answers themselves. After her analysis of the questions and answers of the example, I asked her if she did anything to prepare for reading, or during reading. She replied, "Nope, I just memorize." I asked her to clarify what she memorized, and she said, "Just the important parts." I realized that this could lead to problems with some texts due to the discrepancy of "important stuff"

between the reader and the assessor. We talked about how some things aren't as important to one person as they are to another. She replied, "Riiight.....well, maybe I don't memorize, it's more like soaking it all in." This answer seemed more correct as I watched her read the selected passage from the Earth Science book.

I then assigned the reading from the Earth Science book, Chapter 11.1, passed out the QAR worksheet for the reading (Appendix F), and explained the directions. I also told her that this would be considered homework due for tomorrow if we were in class. I let her read and answer the questions then and there, so we could take a break until the next session. She did not struggle with any of the reading (other than struggling with the fact she had to read a Science book in the summer!), and only had one question that I needed to clarify for her. I think that I am going to implement this activity in my own class for this upcoming school year. Since most of the questions from the book are presented in a similar fashion, this would prove to be an excellent opportunity to show how to identify and answer questions from this book.

The following session, we opened up with a warm up question from the text. It was a simple question ("Right There" quality) that anyone who completed the reading would be able to answer. This allows me to check to see who is doing their homework. I then posted my own notes from the reading, which always includes a couple of stories, demonstrations and explanations. We finished discussing the notes from the readings, and due to those discussions, I felt mostly confident that Katie understood the text and was adequately retaining the material.

The next task was to correct Katie's QAR Questions with her. Katie only answered one question wrong out of five. I asked her about the question that she did not answer correctly.

She claimed she was kind of unsure what it was asking. I had her explain her answer in terms of what she thought the question was asking, and she was right on. I took this time to emphasize that it's important to ask questions whenever there might be some kind of confusion. "Answer the question in the best way you can, then you can go ask your teacher if you are on the right track. Make sure you have an answer first, so the teacher knows you are not just looking for a freebie," I suggested. Given the quality of Katie's responses to the QAR Questions, reading comprehension does not seem to be a problem for her. I would categorize this as an effective learning strategy for her to employ in the future. (Standard III)

They next activity I assigned for Katie was a concept map. Since Katie was the only student in my class, I assigned the main topic and she generated the concept map. (Appendix G) I was pleasantly impressed with the quality and thought that went into Katie's map. She actually developed her map to have one more division/level than the one I had made. I noticed no errors and each term of her strings followed the expectations of being more and more specific. This type of activity really emphasizes the conceptual knowledge and relationships of content. I like to use this activity during an assignment, as a sequential organizer after a lesson, or for a review. (Standard VI) I tell my students to be as creative as possible, and even award extra points for maps that are above, beyond or ingenious. Katie's would qualify for one that might receive extra credit. One variation that I like to employ is to have a group concept map. I either have all the groups brainstorm the same concept and award the winning group a prize, based on popular agreement of all classmates, or assign each group a different topic to share with the class. This is one activity that can assist learners in many different ways, depending on when it is employed.

The last comprehension tool that I utilized with Katie was a Frayer Model. (Appendix H)

I let Katie pick her own topic to brainstorm and she chose convection. I allowed her to reread the text then, I had her fill out the model without using any references. This is an activity that is designed to have students think about the material they have just read in a different way. By allowing them to further categorize the new information, increased student retention can be the result. I have modified the traditional Frayer model due to limitations in the applicable topics. I felt that there was some difficulty with finding topic that could be grouped, or refined, using the existing categories of Essential Characteristics, Non-Essential Characteristics, Examples and Non-Examples. My Model uses the categories of Definitions, Facts/Characteristics, Examples, and Picture. The students seem to like the idea of putting the topic into a picture. This also allows my more artistic students the opportunity to shine. This is also an activity that could be utilized in a group setting. Katie was more enthusiastic about this activity than the others. She drew a wonderful picture of a convection current in pot of boiling water on a stove and adequately filled out all the other categories. No grievous mistakes were found in her model.

For our last activity, I returned Katie's pre/post reading questions and she answered the same questions again. While this is by no means a perfect or detailed assessment of her reading comprehension, it does allow her to express some comparative knowledge about the topics that she has read and the activities she has performed. The results of the post reading quiz this time was 75% (6/8) correct. (Appendix I) The results of the tests show that Katie had almost a 40% increase in her assessment due to reading retention. I would have expected a



greater increase of correct answers based on Katie's past performance in school. Perhaps that is why they aren't quite what was expected; its summer.

In conclusion, this study has shown me how important it is for a teacher to have diverse and differentiated instruction. The results in the increase of comprehension of the main ideas of this unit are satisfactory. "At least I'll be one step ahead of everyone else when this comes up next year," Katie realized at the end of the lessons. I theorize that if this study was done during school, Katie's results would have been more positive. Overall, I believe that the reading comprehension strategies in this study are sound. With a few adjustments in collaborative activities, and the presence of a classroom during regular school hours, I think I have some excellent groundwork laid out. I think the most valuable thing I have learned in this course is that literacy can be taught and supported in all curriculums. I am grateful for the opportunity to enrich my classroom in any way, shape or form, and I promise to be more conscious of literacy in the future.

# APPENDIXES

Appendix A

Name: Katie Date: / Hr: /

Pre-reading

Post-Reading

T or F

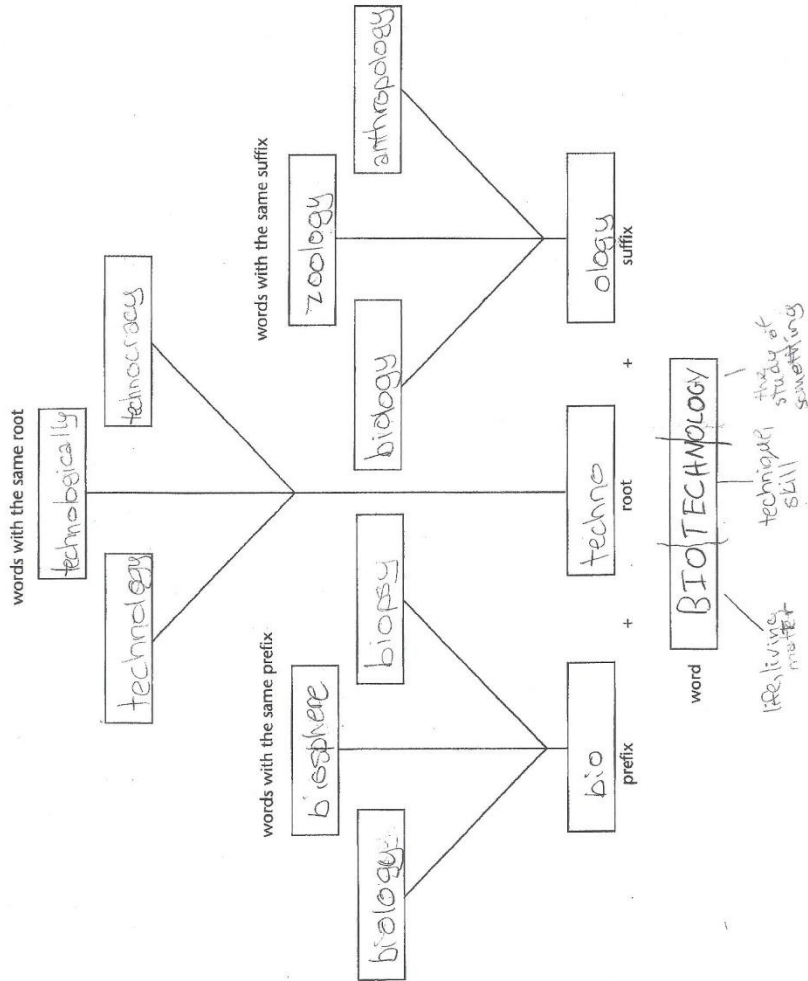
Questions

T or F

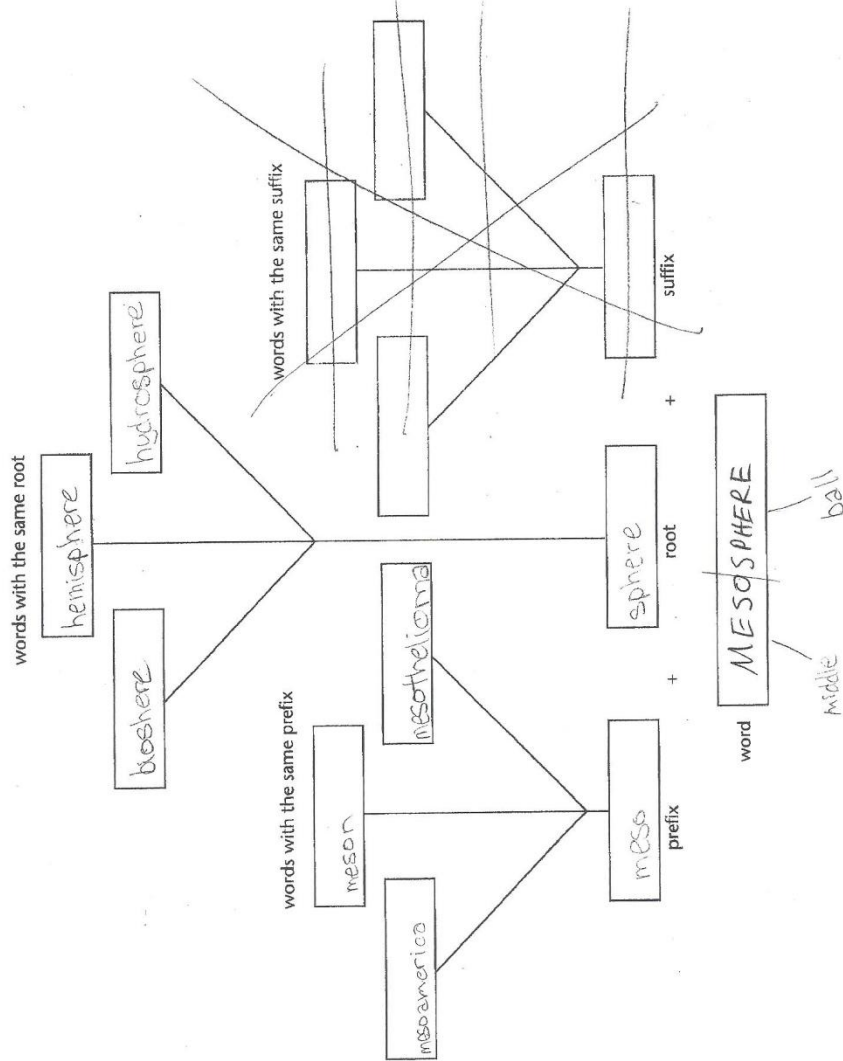
F	1.	Earth's atmosphere is composed mainly of oxygen.	
T	2.	The Earth's atmosphere is consists of many layers characterized by temperature differences.	
T	3.	The hydrosphere is one layer of the atmosphere.	
F	4.	Most of the weather that affects us is found in the lowest layer of the atmosphere, the troposphere.	
F	5.	The processes occurring in the center of the Earth are responsible for all of the energy in the atmosphere.	
F	6.	The three processes of energy transfer in the atmosphere are radiation, conduction and convection.	
T	7.	The main process that warms the upper levels of the troposphere is radiation.	
T	8.	Most of the energy entering the atmosphere is transferred into space.	

\_\_\_\_\_ **TOTALS** \_\_\_\_\_

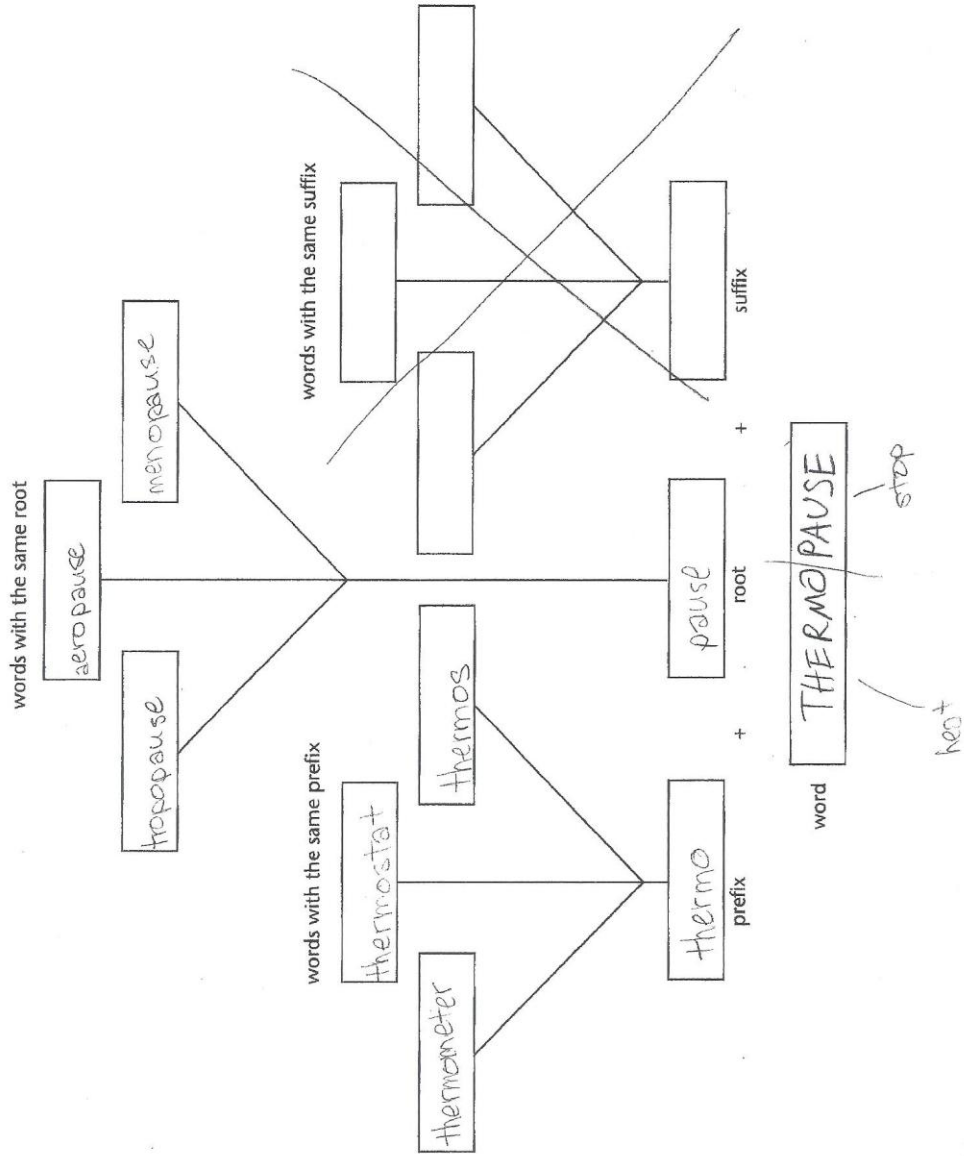
TACKLE DIFFICULT VOCABULARY: CREATE A MORPHOLOGICAL TREE



TACKLE DIFFICULT VOCABULARY: CREATE A MORPHOLOGICAL TREE



TACKLE DIFFICULT VOCABULARY: CREATE A MORPHOLOGICAL TREE



# QAR

## IN THE BOOK

<p><b>Right There</b></p> <p>The answer is in one place in the text.</p> <ul style="list-style-type: none"> <li>▪ reread</li> <li>▪ scan</li> <li>▪ look for key words</li> </ul>	<p><b>Think and Search</b></p> <p>The answer is in several places in the text.</p> <ul style="list-style-type: none"> <li>▪ skim or reread</li> <li>▪ look for important information</li> <li>▪ summarize</li> </ul>
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## IN MY HEAD

<p><b>Author and You</b></p> <p>The answer is not in the text. Think about how what you know and what is in the text fit together.</p> <ul style="list-style-type: none"> <li>▪ reread</li> <li>▪ think about what you already know and what the author says</li> <li>▪ predict</li> </ul>	<p><b>On My Own</b></p> <p>The answer is not in the text.</p> <ul style="list-style-type: none"> <li>▪ think about what you already know</li> <li>▪ think about what you've read before</li> <li>▪ make connections</li> </ul>
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- **I can use QAR when I need to answer questions or create questions.**
- **I can use QAR whenever I need to especially during social studies, science, math, or on tests.**
- **I can use QAR to help me understand and talk about what I read.**

Name: Katie Date:      Hr:     

**QAR Practice – Chapter 11.1 Section Assessment Questions**

**Directions:** Read the text. Answer the questions and identify the QAR.

Question #1:	Question #2:	Question #3:	Question #4:	Question #5:
Describe the importance of water vapor in the atmosphere.	Why does temperature increase with height through the stratosphere?	Rank the main atmospheric gases in the troposphere in order from most abundant to least abundant. Do not include trace gases.	Based on what you know about radiation and conduction, what conclusion might you make about summer temperatures in a large city compared with those in the surrounding countryside?	Of the three main processes of energy transfer throughout the atmosphere, which do you think plays the greatest role in warming the upper troposphere?
QAR: Right There	QAR: Right There	QAR: Right There	QAR: On My Own	QAR: Further And You
Answer: Water vapor is important because if we didn't have it we would have no weather because water vapor is the source of rain, clouds, and snow.	Answer: The stratosphere is made up mostly of ozone which absorbs radiation which heats up the atmosphere.	Answer: Nitrogen Oxygen Argon Carbon Dioxide Water Vapor	Answer: Blacktop is hotter than grass because it absorbs radiation more efficiently. That means the ground in the city is hotter than the ground in the country. There for which convection takes the hotter air up above the city making the air above the city hotter.	Answer: I think radiation because about 35% of the heat coming down from the sun goes back up into the atmosphere



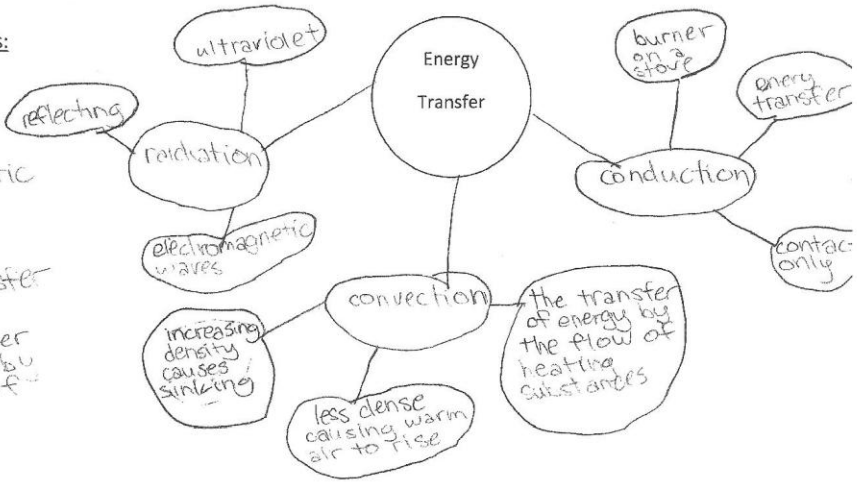
4/5

Name: Katie Date:        Hr:       

### Concept Map

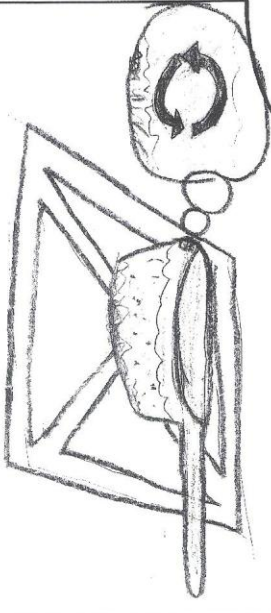
On the left side of the page, please list all the terms, definitions, concepts, etc. associated with the term **ENERGY TRANSFER** in the atmosphere. Then, using those items in the list, develop a concept map showing the relationships in all your items as they relate to how energy is transferred in the atmosphere.

- Associated Terms:**
- ✓ radiation
  - ✓ convection
  - ✓ conduction
  - ✓ ultraviolet
  - ✓ electromagnetic waves
  - ✓ reflecting
  - ✓ burner on a stove
  - ✓ energy transfer
  - ✓ contact
  - ✓ The transfer of energy by the flow of heating substances
  - ✓ warm air rising
  - increasing density causes sinking





# Frayer Model

<p><b>Definition in your own words</b></p> <p>Convection is when a substance gets hot and rises because the heat makes the substance less dense. When the substance moves away from the heat it gets down and gets denser. The heat it gets down and the substance starts to increase again. Then the substance starts again and starts the cycle over again.</p>	<p><b>Facts/characteristics</b></p> <ul style="list-style-type: none"> <li>• All materials move in a circular motion</li> <li>• Convection is always moving in a cycle and it will keep going as long as the heat source is always supplied</li> </ul>
<p><u>Word</u> convection</p>	
<p><b>Examples</b></p> <p>When water boils in a pot the water in the bottom of the pot warms up first. When the water moves away from the flame on the stove the water sinks down again and starts the process over again.</p>	<p><b>Picture</b></p> 

Name: Katie Date: / Hr: /

Pre-reading

Post-Reading

T or F

Questions

T or F

<u>F</u>	1.	Earth's atmosphere is composed mainly of oxygen.	<u>F</u>
<u>T</u>	2.	The Earth's atmosphere is consists of many layers characterized by temperature differences.	<u>T</u>
<del><u>F</u></del>	3.	The hydrosphere is one layer of the atmosphere.	<del><u>F</u></del>
<del><u>F</u></del>	4.	Most of the weather that affects us is found in the lowest layer of the atmosphere, the troposphere.	<u>T</u>
<u>F</u>	5.	The processes occurring in the center of the Earth are responsible for all of the energy in the atmosphere.	<u>F</u>
<del><u>F</u></del>	6.	The three processes of energy transfer in the atmosphere are radiation, conduction and convection.	<u>T</u>
<del><u>F</u></del>	7.	The main process that warms the upper levels of the troposphere is radiation.	<del><u>F</u></del>
<del><u>F</u></del>	8.	Most of the energy entering the atmosphere is transferred into space.	<u>F</u>

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TOTALS

6/8

## **References**

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