

BHS LITERACY WORKSHOP APRIL 28, 2011

READING VISUALS

Slide 1 (1 Minute)

Good Afternoon, _____ and I will lead today's literacy workshop on Reading Visuals.

Slide 2 (1 Minute)

Around this time every year, we do our school wide graphing initiative to help prepare students taking the math and science MCAS exams as well as those taking spring SAT exams. The work we will do today directly relates to our work with openers and closers, problem solving and the graphing initiative but broadens the scope to include other visuals as well.

Slide 3 (1 Minute)

*The targeted literacy objectives for this workshop are **READING**: to gather information and to understand a concept and construct meaning of a visual. **REASONING**: to interpret and explain a table, chart or graph and to identify or explain a pattern and to make a prediction.*

Slide 4 (1 Minute)

Our agenda is -

- 1. Opener – Think and Pair*
- 2. PowerPoint presentation – Reading visuals.*
- 3. Group work - Practice the Reading Visuals 5 steps using actual MCAS prompts*
- 4. Discussion and feedback*
- 5. Closer – Think, Plan, Share*

Slide 5 (2 minutes)

Your opener – Look at the Ferguson data graphs comparing BHS to another school. Think about how you would instruct your students to read the two graphs. Share your responses with the colleagues at your table.

Slide 6 (2 minutes)

*We have been successful at consistently developing instructional strategies that improve our students' literacy skills. Today's faculty meeting is a continuation of that goal with a focus on Reading and Reasoning using visuals. **Here's what we know: When this faculty identifies a skill that needs to be improved and we all worked together to attack it we see impressive improvements in the student scores.** Case in point, the Open Response Strategies helped reduce the ELA failure rate from 40% to 14% within two years. In addition, we continue to make gains in math. Ron Ferguson, a professor at the Achievement Gap Initiative at Harvard University, produced the growth rate data graphs used in the opener. The graphs show that our students' performances on MCAS from grade 8 to grade 10 increase significantly at every level from our highest to our lowest achieving students. The graphs also show our students outperform students in another school with similar demographics. **We also know: to continue to make improvements in math and science we need to implement additional strategies that help students improve their reading and reasoning skills.***

Slide 7 (1 minutes)

The work that we have done with openers and closers aligns with the types of questions students have to answer about the visuals they encounter on MCAS, AP, PSAT, SAT, and ACT exams. Most visuals have at least four questions starting with an opener that requires students to identify something or demonstrate basic knowledge. There are usually two questions that build on that knowledge followed by a rigorous closing question that requires synthesis, justification or evaluation.

Slide 8 (2 minutes)

There are many forms of visual representation that students encounter in all of their classes as well as on the MCAS. Examples of visuals include graphs, tables and webs. Our students often start tackling the question without fully understanding what the visual is about or they skip over the visual altogether. It is imperative that they spend enough time on the visuals to fully understand their meaning and purpose.

A few years ago, the entire faculty met in small interdisciplinary groups and analyzed the math MCAS. Many of you noticed the number of graphs on the exam, which led to the development and revision of our graphing strategies. Earlier this year, in small interdisciplinary groups, we worked on reasoning skills using science questions about Sickle Cell Anemia. Students had to read a complicated passage and use a diagram to answer the multiple-choice and open response questions. For some, the diagram seemed to complicate things and caused people to give up (a level of frustration that many of our students probably experienced as well). Upon

further analysis of the science and math exams, we found that there are several types of visuals on both exams.

Slide 9 (1 minute)

The process of reading a visual begins with understanding and analyzing the given information before attempting to answer the questions or solve a problem.

Slide 10 (2 minutes)

The information that often accompanies the visual may include a title, axes, labels, units, scales and keys—all of which provide insight into what the visual represents.

- *Introductory information*
- *Title*
Information can be derived just from reading the title or the introductory sentences. Just from looking at the title, students should be able to determine what the graph is about
- *Key or legend*
The key or legend explains colors, symbols, number representations or other important information
- *Labels and parenthetical information*
In a visual, it is important to read all of the information provided, including information that appears in parentheses. Labels on graphs often include information about scale in parentheses. Charts and tables have labeled rows and columns.
- *Correlations*
Graphs, charts or tables frequently show a comparison or trend. A web or flowchart shows some relationship between the information given. The direction of the arrows in a flow chart or web provides essential information about relationships.

Slide 11 (2 minutes)

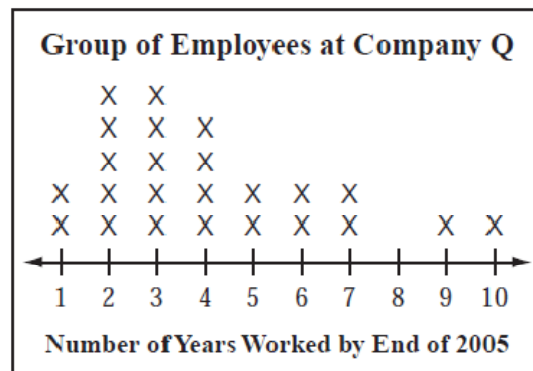
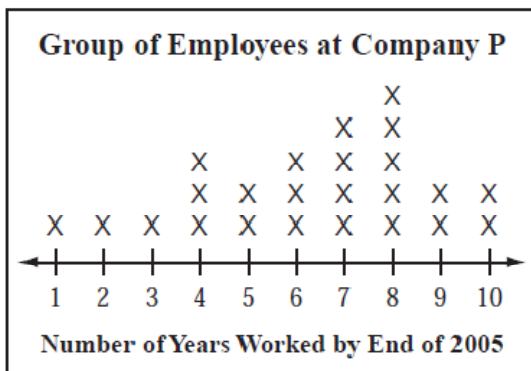
Steps to Follow When Reading Visuals

1. *Identify the type of visual.*
2. *Determine the topic of the visual.*
3. *Examine the given information from the visual (including all introductory text).*
4. *Develop predictions, deductions, inferences or conclusions about the visual.*
5. *Analyze the questions and determine the information needed from the visual.*

Slide 12 (3 minutes)

The following example is of a visual from recent MCAS tests. Here is a sample of how the steps might apply when just examining the visual. The questions have been intentionally eliminated to focus on the steps.

- 17 Carla collects employment data. At the end of 2005, she asked a group of 24 employees at Company P how many years each had worked at that company. She asked the same question of a group of 24 employees at Company Q. The line plots below show her results, where each X represents one employee.



- Step 1 - Identify the type of visual. *(Let teachers respond)*
- Step 2 - Determine the topic of the visual. *(Let teachers respond)*
- Step 3 - Examine the given information from the visual (including all introductory text). *(Let teachers respond)*
- Step 4 - Develop predictions, deductions, inferences or conclusions about the visual. *(Let teachers respond)*
- Step 5 - Analyze the questions and determine the information needed from the visual.

Slide 13 (1 minute)

The students may identify the visual as a plot, a line plot or a frequency plot/table. The visual clearly identifies the number of years each employee has worked at company P or Q. The given information is the number of years each employee has worked through the end of 2005 and the total number of employees.

Slide 14 (1 minute)

There are a number of predictions that can be made from simply examining the visual. In general, the employees at company P have worked there longer than the employees at company

Q. The workforce at company P is probably more experienced. Students may start to anticipate reasons such as the pay or working conditions are better at company P. They may think more people have recently retired from company Q. As you think about this you can probably add to the list of potential ideas.

Slide 15 (1 minutes)

While we are not looking at the questions here, question C sparks some interest. It states, **Without** computing the mean for either group, use the line plots to determine which group of employees has the greater mean number of years worked by the end of 2005. Explain how you got your answer without computing the means. In the brief analysis above and in what a student has hopefully observed just by taking some time to analyze the visual and make sense of it, this question is already answered. **Imagine the power of answering a question before it is asked.**

Slide 16 (12 minutes)

Your Turn

Now you are going to work in groups and practice using the Reading Visuals 5 Steps

- Create groups of 4-5 people
- Use the 5 steps to analyze the visual provided
- Record your group's responses to all 5 steps on the large sheet of paper at your table
- Share your responses with another group using the same visual
- Select a speaker to report out to the whole group
- Report findings

Slide 17 (flash)

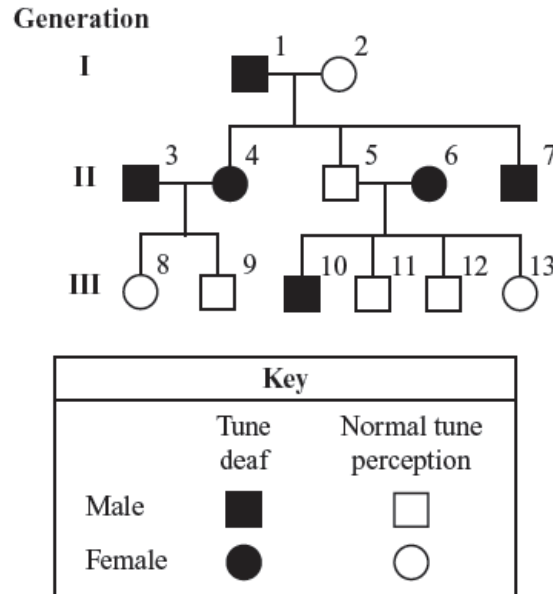
Steps to Follow When Reading Visuals

1. Identify the type of visual.
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Slide 18 (2 minutes for groups to report out)

Ex. #2

- 45 People who are tune deaf are unable to follow a rhythm. Scientists have evidence that tune deafness can be genetic. The pedigree below traces the inheritance of tune deafness in a family. Individuals in the pedigree are numbered.



Scientists have analyzed the inheritance patterns for tune deafness and have concluded that tune deafness is caused by an autosomal dominant allele, **T**.

- Provide evidence from the pedigree that conclusively shows that the tune deafness allele is autosomal dominant, not autosomal recessive. Explain your reasoning.
- Identify the genotypes of individuals 5 and 6, and then draw the Punnett square for the cross of these two individuals.
- Compare the expected percentage of each phenotype of the offspring from the cross in part (b) with the actual percentage of each phenotype observed in the children of individuals 5 and 6.

DO NOT READ - In biology this visual is referred to as a pedigree. Similar visuals are used in other content areas with different names, such as a diagram. The introductory sentences while helpful are not necessary to determine the topic of the pedigree.

The pedigree shows the existence of tune deafness in a family over three generations. The information identifies 13 individuals as male or female, whether or not they have tune deafness and the relationship of tune deafness between the parents and their offspring.

Based on the visual, some predictions and conclusions can be made. For example, tune deafness appears to be an inherited trait that is neither exclusive to males or females, nor does it skip generations. These types of predictions or conclusions prior to reading the questions may help make the questions more understandable and easier to complete.

Slide 19 (flash)

Steps to Follow When Reading Visuals

1. Identify the type of visual.
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5. Analyze the questions and determine the information needed from the visual.

Slide 20 (2 minutes for groups to report out)

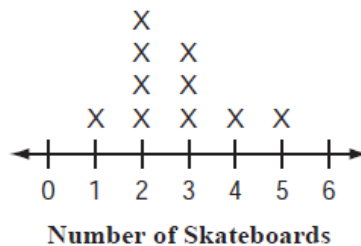
Ex. #3

Questions 20 and 21 are open-response questions.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 20 in the space provided in your Student Answer Booklet.

- 20** The line plot below shows the number of skateboards owned by each of the 10 members of the Skateboard Club.



- a. What is the range of the numbers of skateboards owned by the Skateboard Club members? Show or explain how you got your answer.
- b. What is the mode of the numbers of skateboards owned by the Skateboard Club members? Show or explain how you got your answer.
- c. What is the mean number of skateboards owned by the Skateboard Club members? Show or explain how you got your answer.
- d. What is the median number of skateboards owned by the Skateboard Club members? Show or explain how you got your answer.

Two people became new members of the Skateboard Club. However, the **median** number of skateboards owned by the 12 club members did not change.

- e. What could be the number of skateboards each of the two new club members owns? Explain your reasoning.

Slide 21 (flash)

Steps to Follow When Reading Visuals

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Slide 22 (2 minutes for groups to report out)

Ex. 4

32 The table below shows the classifications of three different sea lions.

	California Sea Lion	Galápagos Sea Lion	New Zealand Sea Lion
Kingdom	Animalia	Animalia	Animalia
Phylum	Chordata	Chordata	Chordata
Class	Mammalia	Mammalia	Mammalia
Order	Carnivora	Carnivora	Carnivora
Family	Otariidae	Otariidae	Otariidae
Genus	<i>Zalophus</i>	<i>Zalophus</i>	<i>Phocarctos</i>
Species	<i>californianus</i>	<i>wollebaeki</i>	<i>hookeri</i>

- a. Identify which two of the sea lions are most closely related.
- b. Justify your answer to part (a).
- c. Describe and explain **two** types of evidence scientists would have used to determine the proper classifications of these three sea lions.

Slide 23 (2 minutes)

Looking Ahead

- *The May 5th faculty meeting will be in department and will focus on using the Reading Visuals Steps with content specific graphs, tables and diagrams*
- *Over the next few weeks we will all use visuals in class to help students develop stronger reading and reasoning skills*
- *Our goal is to improve student achievement across the board and see gains in the science and math MCAS exam scores*
- *Students will use visuals more effectively to answer questions when they:*
 1. *Identify the type of visual.*
 2. *Determine the topic of the visual.*
 3. *Examine the given information from the visual (including all introductory text).*
 4. *Develop predictions, deductions, inferences or conclusions about the visual.*
 5. *Analyze the questions and determine the information needed from the visual.*

Together, we will teach them how to do this and do it well.

Slide 24 (5 minutes)

Today's closer is a Think, Plan, Share:

1. *Identify a visual or type of visual you will use to teach students the Reading Visuals Steps, and*
2. *Describe how the steps for Reading Visuals will help your students improve their reading and reasoning skills*

Slide 25

THANK YOU

Approximate time – 47 minutes