8.0 Science vs. Engineering Review

Worksheet Completion:

8.0 Kahoot score: _____

Teacher signature

Teacher signature

***Each Final Review is worth 4 points on your binder grade. Each Kahoot review is worth 2 points on your binder grade. You must complete the worksheet in the amount of time allotted by your teacher to get a teacher's signature. You must actively participate on each kahoot to get a teacher's signature. If you get 8 teacher signatures before the RISE test, you will earn ice cream. For each additional signature, you will earn toppings for the ice cream.

Qualitative vs. Quantitative

Determine which of the following statements are qualitative and which are quantitative.

1. _____ The cup had a mass of 454 grams.
2. _____ The temperature outside is 250 C.
3. _____ It is warm outside.
4. _____ The tree is 30 feet tall.
5. _____ The building has 25 stories.
6. _____ The building is taller than the tree.
7. _____ The sidewalk is long.
8. _____ The sidewalk is 100 meters long.
9. _____ The race was over quickly.
10. _____ The race was over in 10 minutes.

Scientists Vs. Engineers

Indicate the following statements as a characteristic of SCIENTISTS or ENGINEERS.

11. _____ ask questions and develops an <u>experiment</u> to answer that question.
12. _____ identify a specific <u>need</u>: Who need(s) what because why? And then, he or she creates a solution that meets the need.
13. _____ <u>create</u> new things, such as products, websites, environments, and experiences.
14. _____ study how <u>nature</u> works.
15. _____ create solutions to problems.

Scientific Method

An engineering company wants to test 3 different bridge materials to see which material will hold the greatest load. The materials are: Steel, Wood, or Concrete. Identify the following parts of the experiment as if you were to plan out and conduct the test on your own.

16. What is a possible "Hypothesis"?
17. What is the "Independent variable"?
18. What is the "Dependent variable"?
19. What are the "Controlled variables"?
20. What visual format would you use to display and summarize your data so it can be analyzed and a conclusion can be made?

Each of the following sentences describes a step of the scientific method. Write the step which best fits each of the examples below on the line to the left of each sentence. Use these steps of the scientific method:

a. Purpose
b. Research
c. Hypothesis
d. Experiment
e. Data/Analysis
f. Conclusion

_____ 21. Pat saw dark clouds overhead. He said, "I think it is going to rain."

_____ 22. Ed timed the eclipse in minutes and seconds. He wanted to see if the newspaper prediction was correct.

_____ 23. Every summer Paul went to the beach with his family. After several summers, he concluded that the beach is always changing.

_____ 24. Jenny told the class, "I saw the moon today on my way to school. How is that possible?"

_____ 25. A geologist gathers fossils and looks up information about the location the fossils were found.

Independent and Dependent Variables

Identify the independent and dependent variables in the following statements.

25) The more time people spend using social media, the less they read books.

Independent Variable: _____   Dependent Variable: _____

27) Drinking energy drinks makes people more aggressive.

Independent Variable:_____   Dependent Variable: _____

28) Taking a nap in the afternoon makes people more focused for the rest of the day.

Independent Variable: _____   Dependent Variable: _____

29) Spending time with a family dog decreases the amount of stress someone is feeling.

Independent Variable: _____   Dependent Variable: _____

30) Eating breakfast in the morning increases a student's ability to learn in school.

Independent Variable:_____   Dependent Variable: _____

Engineering Design Process

Students are given a challenge to design a catapult that will launch marshmallows at a target. They want their catapult to be both accurate and precise. Choosing from the steps of the Engineering Design Process, match the sentences below, with the appropriate step of the engineering design process.

a. Ask
b. Imagine
c. Plan
d. Create
e. Improve

_____ 31. Cassidy draws a design for her catapult.

_____ 32. Isaac's catapult does not shoot the marshmallows into the target. He makes adjustments to his design and tries again.

_____ 33. Damian constructs a catapult from the design that he drew and shoots his marshmallows. He draws the target and draws each place that the marshmallow lands.

_____ 34. Mrs. Scholes gives her students the challenge to design a toy that kids can use to launch marshmallows at a target.

_____ 35. Isabel and Mikah draw a series of ideas for their designs and discuss which design they think will work the best.

Interpreting Data:
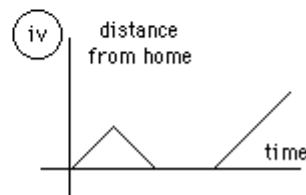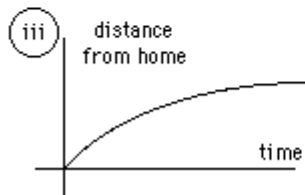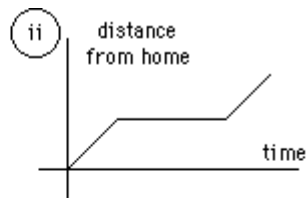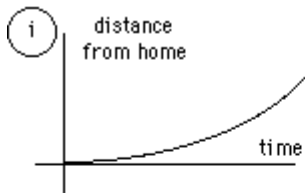
36. Identify the graph that matches each of the following stories:

a. I had just left home when I realized I had forgotten my books so I went back to pick them up. I ate a snack and then continued my journey. _____

b. Things went fine until I had a flat tire. I fixed it and kept going. _____

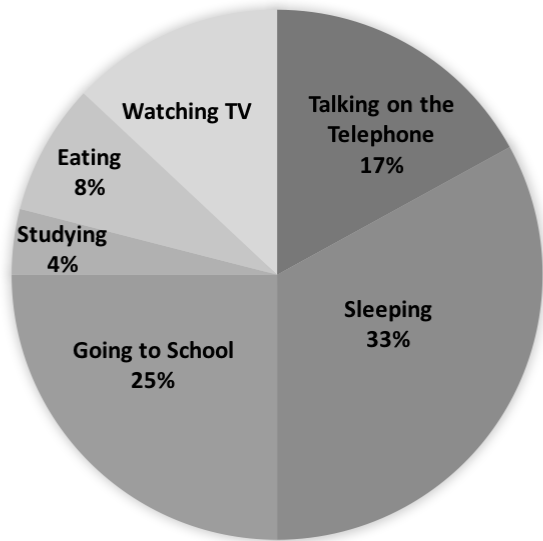c. I started out calmly, but sped up when I realized I was going to be late. _____

37. Answer these questions about the graph to the left:
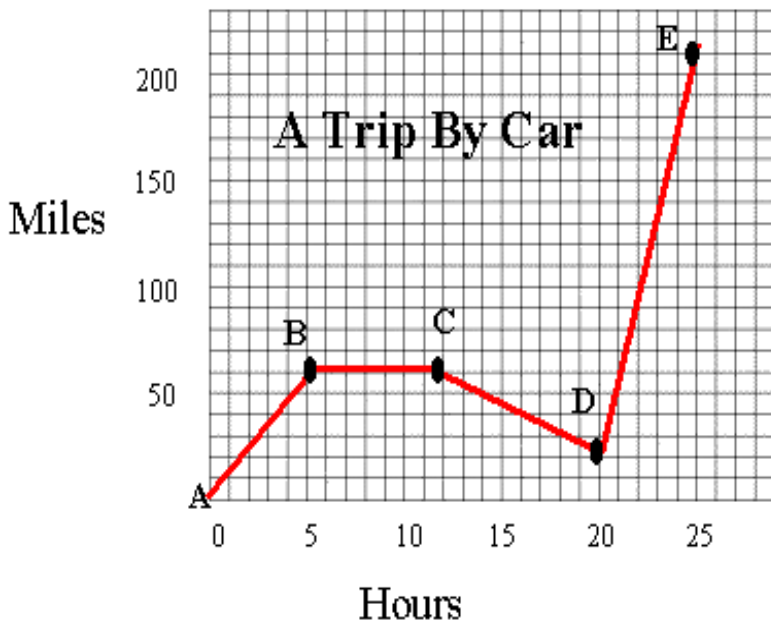
a. How many sets of data are represented? _____

b. On approximately what calendar month does the graph begin? _____

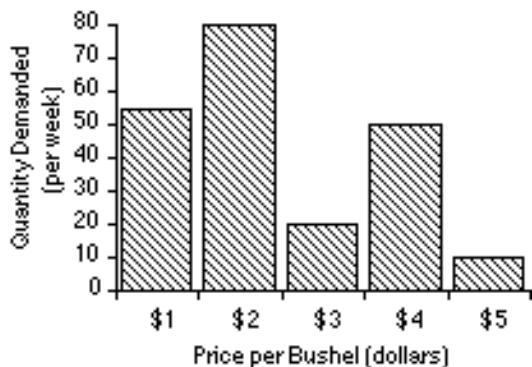c. In what month does the graph reach its highest point? _____

Pie Chart (left):

Watching TV

Talking on the Telephone 17%

Eating 8%

Studying 4%

Sleeping 33%

Going to School 25%

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38. The graph to the left represents the typical day of a teenager. Answer these questions:

a. What percent of the day is spent watching TV? (Hint: The total pie graph is 100%) _____

b. How many hours are spent sleeping?_____

c. What activity takes up the least amount of time? _____

d. What activity takes up a quarter of the day? _____

e. What two activities take up 50% of the day? _____

f. What two activities take up 25% of the day? _____

Graph (left): A Trip By Car

Y-axis: Miles (50, 100, 150, 200)
X-axis: Hours (0, 5, 10, 15, 20, 25)

Points labeled A, B, C, D, E

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39. Answer these questions about the graph to the left:

a. How many total miles did the car travel? _____

b. What was the average speed of the car for the trip? (Hint: Total Distance / Total Time)_____

c. Describe the motion of the car between hours 5 and 12?

a. What is happening between points C and D?

e. How many miles were traveled in the first two hours of the trip?

f. Between which two points is the fastest speed?

Bar Graph (left):

Y-axis: Quantity Demanded (per week) (0, 10, 20, 30, 40, 50, 60, 70, 80)
X-axis: Price per Bushel (dollars) ($1, $2, $3, $4, $5)

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40. Answer these questions about the graph to the left:

a. What is the dependent variable on this graph?

b. Does the price per bushel always increase with demand?

c. What is the demand when the price is $5 per bushel?