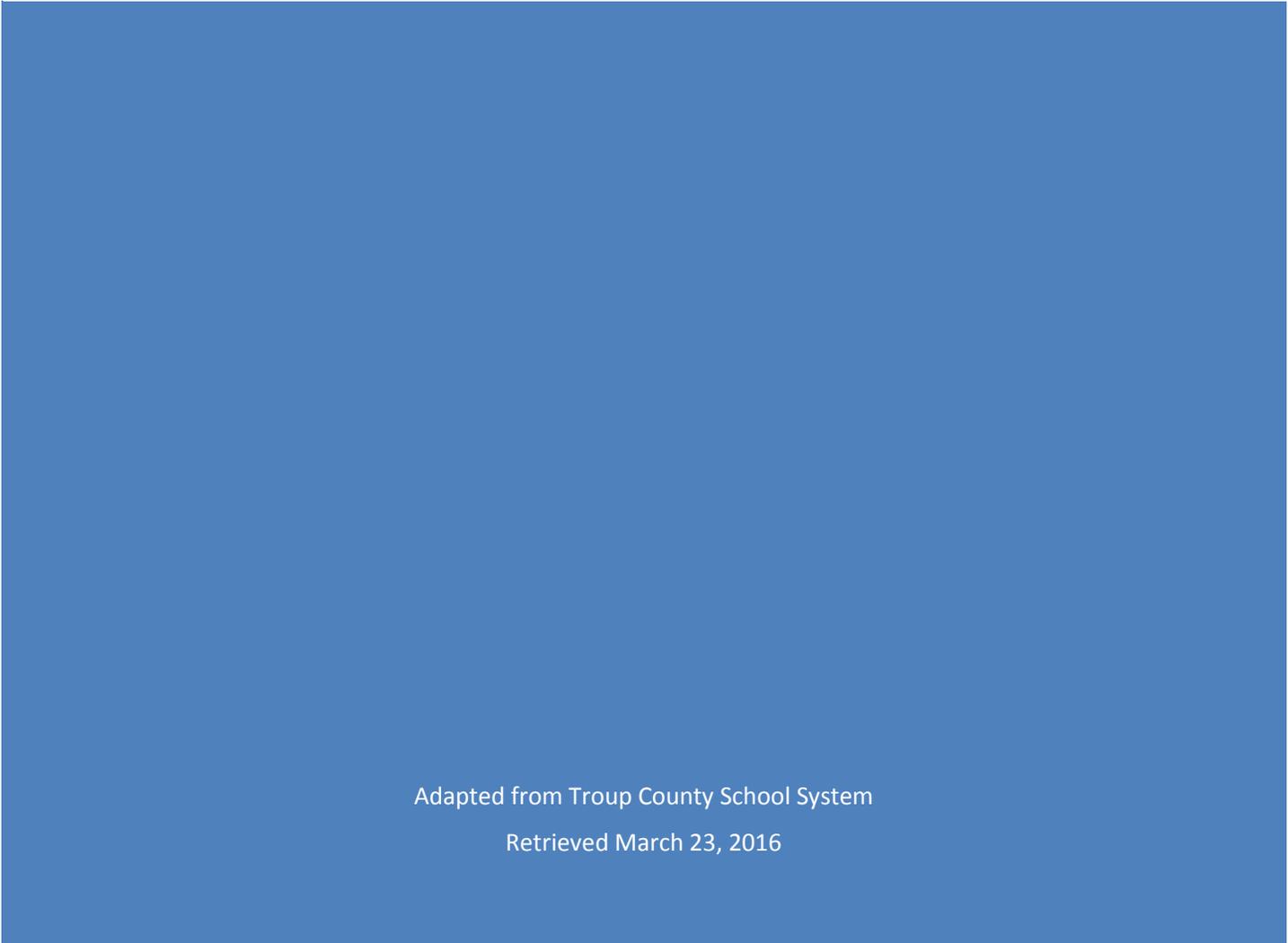




SUMTER MIDDLE FORCE STUDY GUIDE

Adapted from Troup County School System

Retrieved March 23, 2016



Forces Unit Study Guide

Name _____ Date _____ Period _____

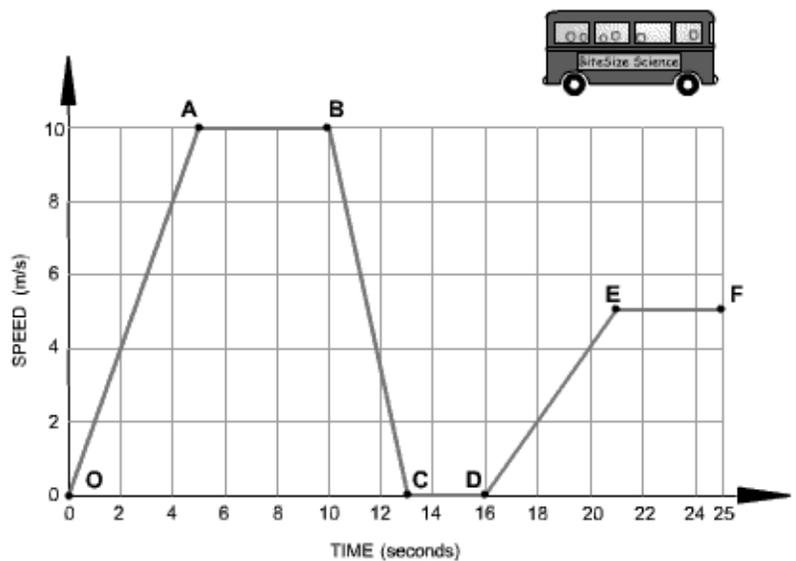
1. Identify whether the following statements describe a change in acceleration. Explain your response. (S8P3a)

- A car stopped at a stop sign.
- A boat traveling east at 10 knots.
- An airplane traveling north 600 miles per hour.
- A person running at 5 meters/second along a curving path.

2. Describe what is meant by “a constant change of direction”. Identify whether the examples provided show a constant change of direction when moving. (S8P3a)

- A merry-go-round spinning in circles.
- A wind vane swinging around.
- A kid walking on a straight path.

The graph below shows how the speed of a bus changes during part of a journey. Use this graph to answer questions 3-5



3. In Segment B-C, the bus is _____ (accelerating; decelerating; at rest; at constant speed) Why?

4. In Segment C-D, the bus is _____ (accelerating; decelerating; at rest; at constant speed) Why?

5. Which Segment(s) is accelerating? How do you know?

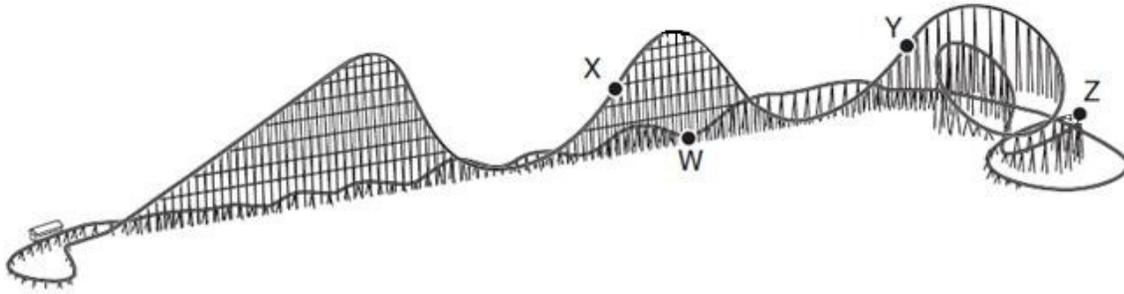
6. The table to the right shows the time it takes three trucks to go from 0 to 60 km/h. Based on the information given, what data can be compared for the three trucks? (S8P3a)

Truck	Time(s)
1	4.5
2	3.1
3	5.5

7. On a frictionless surface, how does the increase in an object’s mass affect its acceleration? (S8P3a)

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8. At which point in the diagram above would the rate of acceleration be the greatest? Explain your answer. (S8P3a)

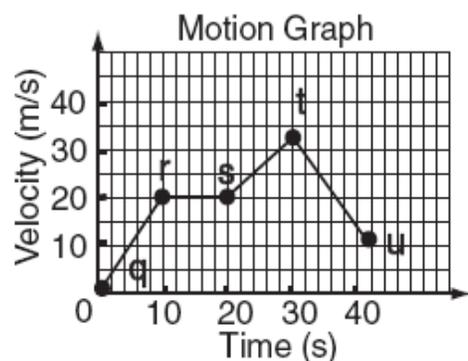
9. Define inertia. (S8P3b)

10. Identify which of the following objects has the most inertia: 3 g gumball; 2 kg tennis ball; 2 g ping pong ball; 5 kg basketball. Explain your answer. (S8P3b)

11. The diagram to the right shows a skier finishing a competition. What happens to his speed and direction as he rounds the finish line? (S8P3a)



12. According to the graph to the right, what was the acceleration of the object between Points R and S? Explain your answer. (S8P3a)

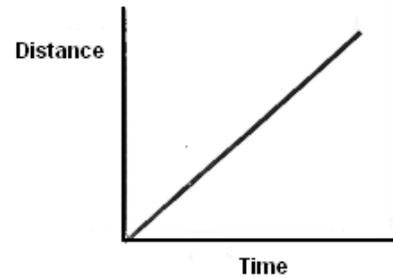


13. Explain why an object does not move even though a force is exerted on the object. (S8P3b)

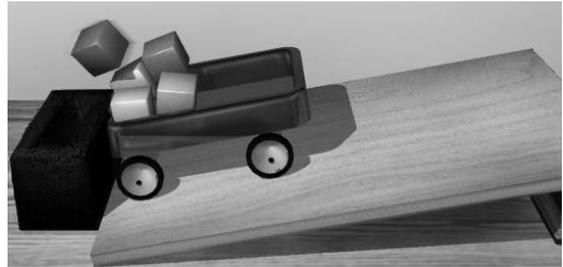
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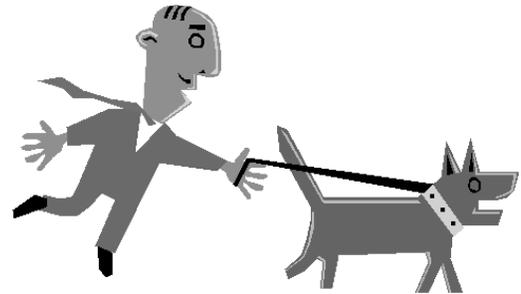
14. What does the graph to the right illustrate about the speed of an object? (S8P3a)



15. The diagram to the right shows a cart full of blocks coming to a sudden stop. Explain what happens to the blocks in the cart. (S8P3b)



16. The diagram to the right shows a man trying to walk a dog, but the man and the dog are moving in the same direction. Draw an arrow below the diagram showing the direction of movement and describe the forces in this situation (balanced, unbalanced, which force is greater). (S8P3b)



17. A tractor company decides to reduce the mass of its tractor by 100 kg. The new tractor design is identical to the old design in everything other than weight. Compare the force it would take to move the old tractor to the force it would take to move the new tractor. (S8P3b)

18. Describe the principle “Every action has an equal and opposite reaction”. (S8P3b)

19. A group of elementary students were playing shuffle board on the playground. One student pushed the puck toward the opposite side of the game board. The student thought the puck would continue all the way to the other side, but the puck stopped half-way down the board. Explain in terms of force why the puck failed to slide all the way to the opposite side of the board. (S8P3b)

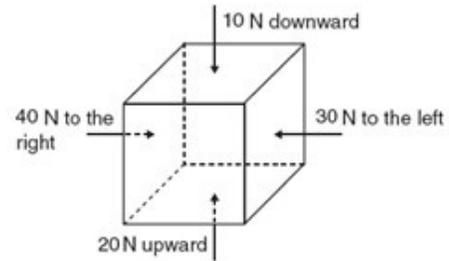
20. Identify the simple machines found in a pair of scissors. (S8P3c)

21. Define a fulcrum. (S8P3c)

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22. Look at the diagram of the box to the right. In which direction will the box increase in speed? Explain your answer. (S8P3b)



23. Look at the figures to the right. Which figure will remain stationary unless an external force acts on it? Assume there is no friction. Explain your answer. (S8P3b)

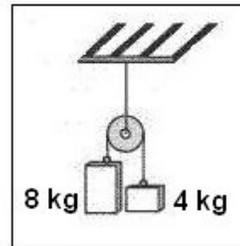


Figure 1

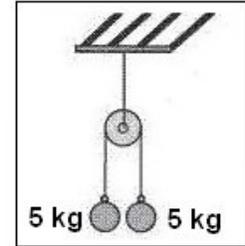
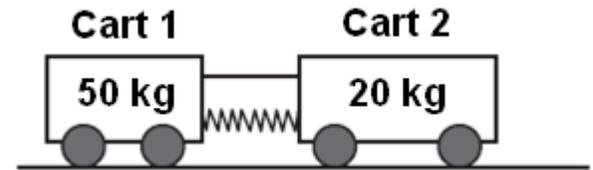
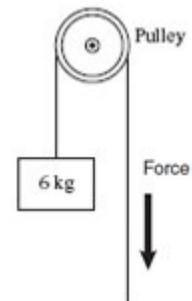


Figure 2

24. Carts 1 and 2 in the diagram to the right have a compressed spring between them. The carts are held together by a cord. When the cord is cut, the compressed spring will force the carts apart. When this happens, how will the acceleration of Cart 1 differ from that of Cart 2? Explain your answer. (S8P3b)



25. The picture to the right shows a pulley being used to move a 6 kg block. In which direction will the block move if the force applied to the rope is greater than the force of gravity on the load? (S8P3b)



26. A force (F_1) is required to push a 15kg container across a carpeted floor. A force (F_2) is required to push the same 15kg container across the ice at a rink. What is typically true about the F_1 force in comparison to the F_2 force? (S8P3b)

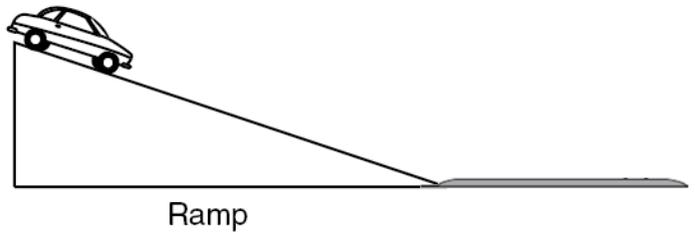
27. What simple machines are found in a can opener? (S8P3c)

28. The groove on a screw is an example of which type of simple machine? (S8P3c)

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A student sets up the experiment shown in the diagram to the right to investigate how friction affects the motion of a toy car.



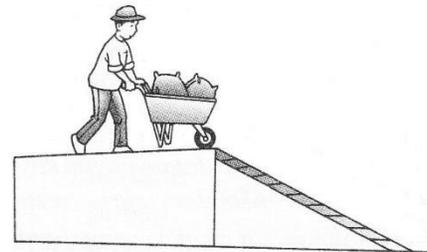
29. The student releases the car down the ramp and measures how far the car travels. Which variable must the student change to test how friction affects the motion of the car? (S8P3b)

30. Identify the simple machines found in the bicycle to the right. (S8P3c)



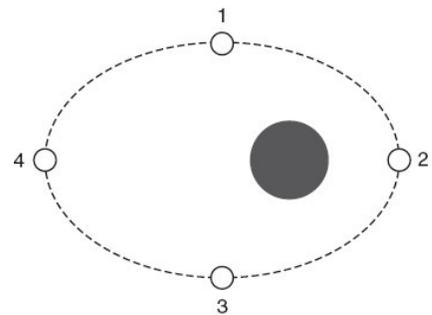
31. Since the bicycle has more than one simple machine, it is called a _____. (S8P3c)

32. Identify the simple machines used by the man in the diagram to the right to make his work easier. (S8P3c)



33. How does the distance between two objects and their mass affect gravitational attraction (force) between the two objects? (S8P5a)

34. The diagram to the right shows a moon revolving around a planet in an orbit. At which location is the gravitational pull between the moon and the planet the weakest? Explain your answer. (S8P5a)



35. During the Force and Motion Unit, your class participated in the JetToy Challenge activity. Identify the forces that can influence the performance of the JetToy.

