Name _____

Forces Review Sheet

Test is on _____

1. Add an arrow to show a force diagram for the illustration above.

Match the force to the description.

2.	Friction	A. a push or pull that causes an object to move, stop, or change direction
3.	Force	B. how fast or slow movement is or distance divided by time
4.	Gravity	C. force that is applied in the opposite direction of an object's motion
5.	Speed	D. Earth pulls down on all objects with this force
6.	Weight	E. Measure of the gravitational force between an object and the Earth.

7. What can happen to the motion of an object when only one force is acting on the object?
   a. _____
   b. _____
   c. _____

8. What do students need to calculate the average speed of a toy car:
   a. _____ b. _____

9. A student stacks books on a skateboard and pushes it down a hall. What changes could the student make that would result in the skateboard reaching the end of the hall faster?
   a. _____
   b. _____

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10. A student puts the items listed below on a table. Write numbers to describe the gravitational force acting on each object, with 1 being the object that experiences the least amount of gravitational force and 5 experiencing the most gravitational force.
    a. _____ Penny
    b. _____ Box of crayons
    c. _____ Bag filled with books
    d. _____ 2 Liter bottle of soda
    e. _____ School bus

7. A student measures the distance traveled by several toy cars in different time periods. Use the table below to calculate the speed of each car:

Toy Car Data

Car	Distance traveled (Meters)	Time (seconds)
E	2	2
F	8	4
G	4	1
H	0	2

Toy Car Speeds

Car	Calculation (distance divided by time)	speed
E		
F		
G		
H		

8. Write numbers in the table to the right to compare the average speed of each car, from 1 being the lowest average speed to 4 being the highest average speed.

Car	Order
E	
F	
G	
H	

9. Jose pushes 3 cars with the same force. His data is shown below.

Object	Mass	Distance	Time
Red car	5 g	40 cm	5 s
Blue car	10 g		5 s
Green car	15 g	10 cm	5 s

Complete Jose's data chart.

10. Then circle the fastest car.

11. Put a box around the slowest car.

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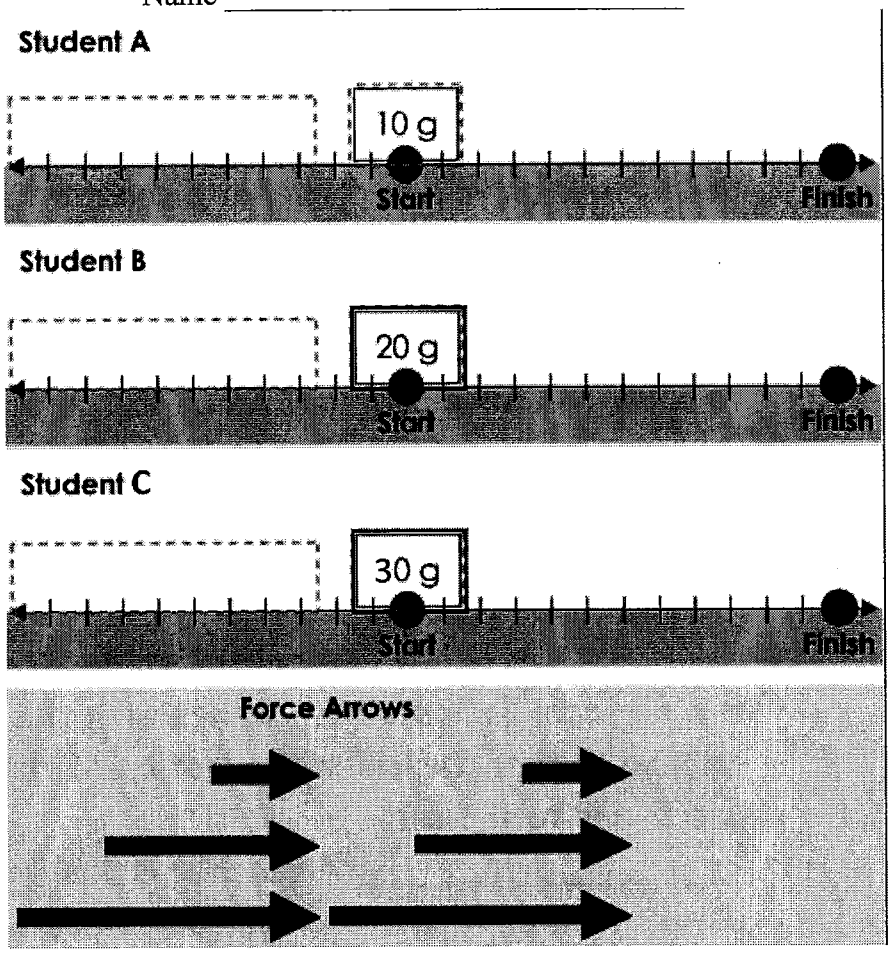
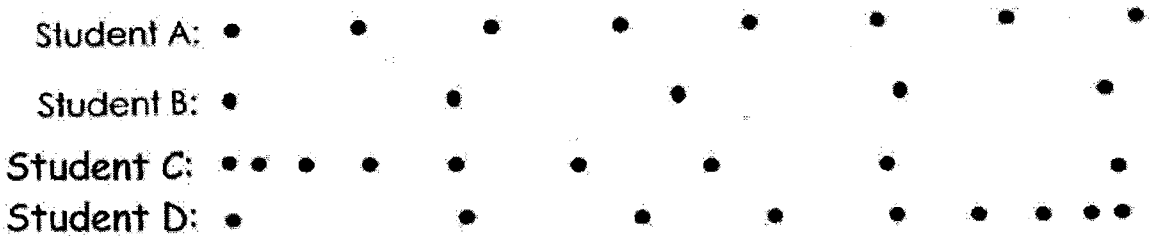
12. Students are pushing blocks of different masses along the floor. They start the blocks at the same position and time and try to push them so that each block gets to the same finish position at the same time. Draw arrows to the left of each block to represent the amount of force needed for each block to get to the finish position at the same time.



13. Four students went to a track. Some walked, some ran and others did both. Look at the diagrams. A dot was made each second.



What is each student doing?

a. _____

b. _____

c. _____

d. _____

Name _____

Write words to describe how the described action will affect the motion of the objects:

14. _____ A student applies a constant force to the pedals of a bicycle to travel at a constant speed on a calm day. Suddenly a strong gust of wind blows straight toward the front of the student. Describe the motion of the student on the bicycle immediately after the wind started to blow if the student continues to apply the same constant force to the pedals.

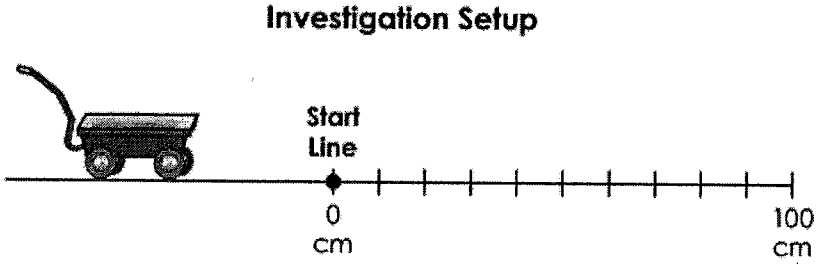
15. _____ A pair of students push an empty cart across the surface. Each student pushes with the same force for the same amount of time. Describe the motion of the cart when another student helps push the cart.

16. _____ A pair of students push an empty cart across the surface. Each student pushes with the same force for the same amount of time. Describe the motion of the cart when the students add books to the cart.

17. _____ A teacher is pushing a cart filled with books down a hallway with a wooden floor. Describe the amount of force needed when the teacher puts fewer books on the cart.

18. _____ A teacher is pushing a cart filled with books down a hallway with a wooden floor. Describe the amount of force needed when the teacher gets to a room with carpeted floor.

19. Students investigate how mass and force affect the motion of a cart. For trial 1, they use an empty cart. They place the cart on a straight, smooth track. A student applies a brief force to the resting cart to move it on the track. When the cart crosses the start line, the force is removed and a stopwatch starts timing. The students record that for trial 1, the cart travels 50 centimeters (cm) in 5 seconds. Add dots to the diagram to show the position of the cart at 1 second, 2 seconds, 3 seconds, 4 seconds, and 5 seconds.



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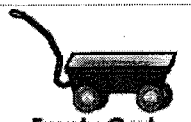
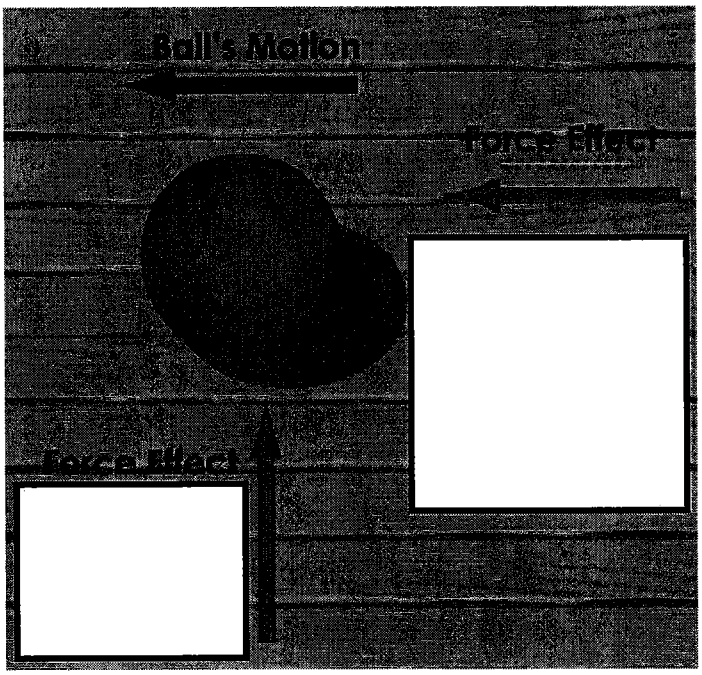
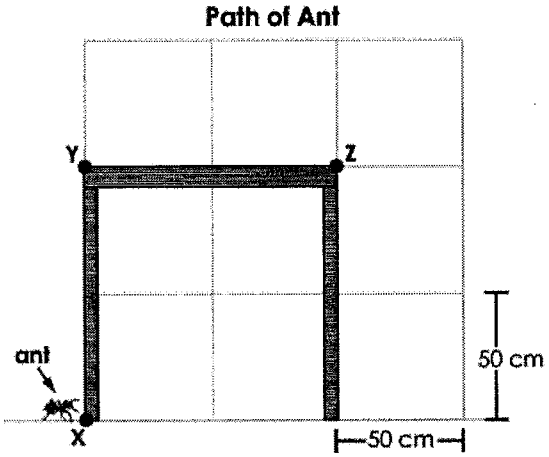
20. The students perform two more trials. For trial 2, they change the amount of force used to push the cart. For trial 3, they double the mass of the cart by adding bricks. Enter a number in the table to predict the distance traveled by the cart in 5 seconds after is crosses the start line for trials 2 and 3.

Trial	Force Applied (N)	Distance at 5 s (cm)
 Empty Cart	1	50
 Empty Cart	2	
 Cart Carrying Bricks	1	

21. A ball moves across a table. The ball moves from right to left as shown by the top arrow. Forces can be applied to the moving ball. The red arrows indicate those forces and show the direction each force would act on the ball. Write the effect that each force would have on the ball's motion into each blank box.





22. An ant crawls up a table leg from point X to the top of the table to point Y. Then it crawls across the tabletop to point Z. The graph lines show that each square measure 50 centimeters (cm) in length. It took the ant 2 minutes (min) to walk from point X all the way to point Z. What was the average speed of the ant?

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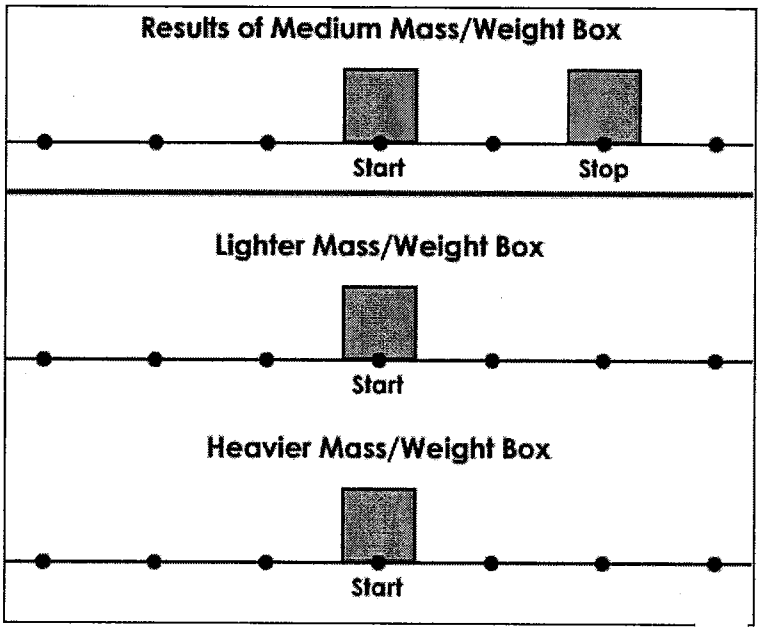
23. A student is running a computer simulation to learn about how objects move. Following are some details of the simulation.
    - The simulation uses three boxes that are the same size.
    - Each box has a different mass/weight.
    - The boxes are all on the same surface.
    - The same force is applied to each box over the same amount of time.

    The student runs the simulation for the box with a medium mass/weight. The result of the simulation is shown. Draw a box at the black dot to show where the lighter and heavier boxes will stop.



24. A delivery truck makes a trip from Akron to Columbus. The truck departs from Akron at 4:00 pm and arrives at Columbus at 6:00 pm. The truck travels a distance of 120 miles. What is the average speed of the truck during the entire journey?

_____

25. Ball X and Ball Y start from rest. A force is applied to each ball for 3 seconds.
    a. Draw a force arrow into the blank boxes to show the strength of the forces that act on Ball X and Ball Y. The length of the arrow shows the strength of the force.
    b. Circle the position of each ball as a result of the force applied to it.