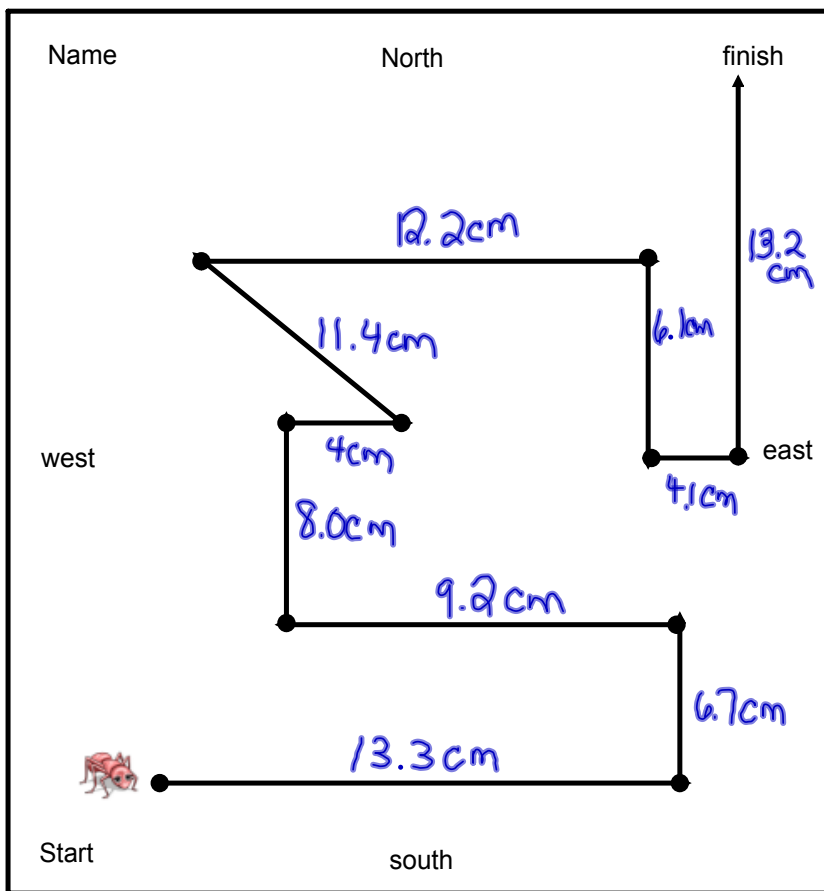


Introduction to Forces in Motion

Ant Maze Assignment

1. Hold paper vertically put name in UPPER LEFT hand corner
2. Put the word START in the lower left hand corner and FINISH in the upper right hand corner
3. Label North South East West on your paper
4. Draw an ant in the lower left hand corner near the word start
5. Using a ruler begin drawing a path for your ant - using horizontal, vertical and diagonal lines. Your path should have several turns.
6. When your ant has reached the finish line, you will now measure your maze.
7. Using a metric ruler, measure to the nearest millimeter using centimeters
ex) 4.7 cm = 4 cm and 7 mm
8. When each line is labeled correctly, flip your paper over and give directions for your maze using distance and direction

ex) 1. begin by going east 4.7 cm
2. now go north 3.3 cm
3. next go north west 10.8 cm
etc.



Ant Maze example

- 1. Begin by going east 13.3 cm**
- 2. Then north 6.7 cm**
- 3. Next go 9.2 cm west**
- 4. Then 8.0 cm north**
- 5. Then 4 cm east**
- 6. Then 11.4 cm northwest**
- 7. Then 12.2 cm east**
- 8. Next 6.1 cm south**
- 9. 4.1 cm east**
- 10. Finally, 13.2 cm north to finish**

NAME _____

STUDY GUIDE - FORCES AND MOTION
Section 1 From Feet to Fathoms

DEFINE:

ASTRONOMICAL UNIT

METRIC UNIT

Fill in the blank with the correct term.

1. A/An _____ is equal to the average distance from the earth to the sun, about 150 million kilometers.
2. The English system of measurement used by most people in the United states includes _____
3. Fathom, the depth of about ____ comes from the Old English word meaning _____
4. _____ ordered the development of the metric system in the 1790's.
5. The metric units of measurement include _____.
6. Metric units are based on standards that do not _____.

7. Fill in the table

Metric Units	
Measurement	Unit
•	•
•	•
•	•

Investigation 1 Questions Page F11

1. What two factors would you include in a description of the route you take from home to school?

2. How does having a set of standards make a system of measurement more reliable?

3. Would you measure the length of a pencil in meters or centimeters? Explain.

4. Since one complete turn of a compass needle describes a circle, how many degrees of direction are shown on a compass?

STUDY GUIDE - FORCES AND MOTION
Section 2 Bicycle Cyclometers-What is Speed

8. A _____ is a device that keeps track of the total distance traveled on a bike and the rider's _____.
9. As of 1990, the fastest official time of a land vehicle was _____ mph
10. _____ is the distance traveled in a given amount of _____.
11. Average speed = _____
- $$\text{speed} = \frac{d}{t}$$

Practice Speed Problems

Distance	Time	Speed
20 m	4 sec	•
25 m	4.5 sec	•
25 m	2.5	•

Investigation 2 Questions Page F17

1. If you want to measure the speed of a car, what two factors do you need to know?

2. If an airplane flies 500 mph in 2.5 hours, what is the average speed?

3. Why do you have to know circumference of your bicycle's wheel in order to set a cyclometer?

4. How can the average speed of an object be used to determine an unmeasured distance?

STUDY GUIDE - FORCES AND MOTION
Section 3 Acceleration

ACCELERATION _____

DECELERATION _____

12. _____ is the term used to describe both speed and direction.
13. The rate at which velocity changes is called _____.
14. Even when your speed is constant, you are _____ if you are changing direction.
15. _____, such as burning fuel, can cause an object to accelerate.
16. Acceleration = _____
17. 5km/h/min is an example of a unit of _____.
18. The decrease in speed is sometimes called _____.
19. Since any change in speed or direction is defined as acceleration _____ is just another type of _____.
20. _____ causes objects on the way down to accelerate.

Acceleration Practice

$$\text{Acceleration} = \frac{S_2 - S_1}{T} \quad (6\text{k/h/sec}) \quad \text{example } 10 \text{ kph to } 70 \text{ kph} \quad \frac{70 - 10}{6} \frac{60}{6} = 10 \text{ seconds}$$

ex 1) we want to accelerate from 20 kph to 50 kph at an acceleration of 6 k/h/sec

21. The type of brakes found on most cars today are called _____.
22. _____ between the stationary object and the rotating wheel causes the wheel to slow down and stop.
23. Stopping distance depends on:
- a. _____
 - b. _____
 - c. _____
 - d. _____
24. The most important factor in determining actual _____ is _____ at which a vehicle is traveling.
25. The faster a car is traveling the _____ the braking distance for the car to stop.

Investigation 3 Questions F26

1. When is an object accelerating?

2. You observe a ball bouncing down a staircase. In what ways is the ball accelerating?

3. Use the terms velocity and accelerate to describe the motion of a race car moving on an oval track.

4. How is it possible for gravity to cause both acceleration and deceleration of an object?
