**FORCE AND MOTION QUIZ REVIEW** **Quiz Date: _____**

This quiz will cover some of the information that we talked about from our Force & Motion unit so far. It will consist of some multiple choice, fill-in-the-blank, and short answer questions (including drawing free body diagrams). To prepare you should review DQs, handouts, your Mind Map, and concepts from labs we've done. Make sure you can successfully hit these learning targets:

- I can define motion and describe the difference between speed, velocity, and acceleration.
- I can interpret a scenario to calculate the speed, velocity, and acceleration using the correct units of measure.
- I can define force, give examples of forces, and interpret how forces impact motion.
- I can draw and interpret free body diagrams.

1. Which of the following is an example of acceleration?

A. a boat speeding up
C. a jogger slowing down
B. a wind turbine spinning at a constant speed
D. all of the above

2. If one person pulls a heavy couch to the left and another person pushes it in the same direction, then:

A. the couch will not move
C. the net force will be greater than the force exerted by one person
B. the couch will split in two pieces
D. the net force will be less than the force exerted by one person

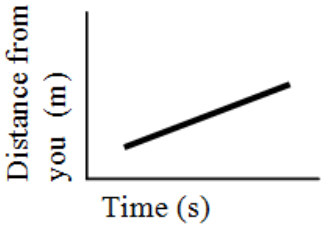
3. A car traveling at 80 km/h north is an example of:

A. speed
C. acceleration
B. velocity
D. all of the above

4. Friction will _____ the amount of movement between two objects.

A. increase
C. have no effect on
B. decrease
D. speed up

5. The graph at right shows an object:




A. moving towards you
C. with negative acceleration
B. maintaining constant speed
D. with zero speed

6. A race car driving experiences _____ friction with the road.

A. rolling
C. fluid
B. static
D. sliding

7. The support force of a table holding up a book is called _____.

A. applied force
C. normal force
B. gravitational force
D. friction

8. A force is a _____ or a _____. The unit used to measure force are _____.

9. Air resistance is a type of _____. How is air resistance helpful?

10. An object's motion will change if the forces acting on it are _____.

11. A lion runs 400 meters in 20 seconds. What is the lion's average speed? Show the formula you used, your work, and be sure your answer has the correct units.

12. A helicopter is traveling at a velocity of 500 km/h over Seattle headed south. It flies over Portland 2 hours later at a velocity of 400 km/h south. What is the helicopter's acceleration? Show the formula you used, show your work and be sure your answer has the correct units.

13. James Bond is running inside a train. The train is traveling 30 m/s east. Bond is running 3 m/s west. What is James Bond's overall velocity? Show the formula you used, show your work, and be sure your answer has the correct units.

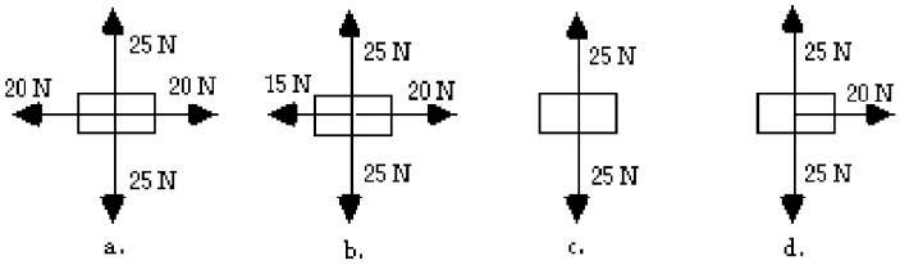
14. A monkey is sitting in a tree when suddenly he gets dizzy and falls. Right before landing on his feet 5 seconds later, his velocity is 49 m/s. What is his acceleration? Show the formula you used, show your work and be sure your answer has the correct units.

15. Use an example to show why a reference point is necessary to detect motion.

16. Give a specific example of a force that:

- Starts an object moving:
- Stops an object's motion:
- Causes an object to change direction:

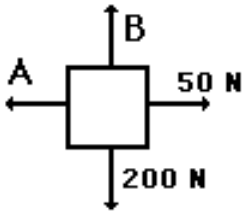
17. Which one(s) of the following free body diagrams depict an object accelerating to the right? Circle all that apply.




18. In the diagram above, which of the objects would be at rest? List all that apply. What must be true about the forces if an object is at rest?

19. In the diagram above, which of the objects would be accelerating the fastest? List all that apply.

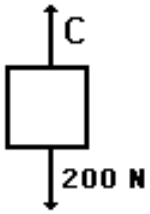
20. Each diagram below shows the forces acting on an object and states the net force ($F_{net}$). List what the forces must be in order to create the net force listed.




$F_{net}$ = 0 N

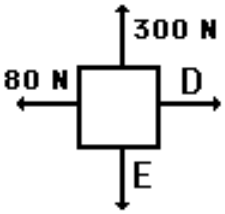
Force A: _____

Force B: _____




$F_{net}$ = 900 N, up

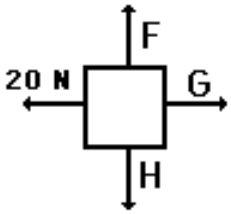
Force C: _____




$F_{net}$ = 60 N, left

Force D: _____

Force E: _____




$F_{net}$ = 30 N, right

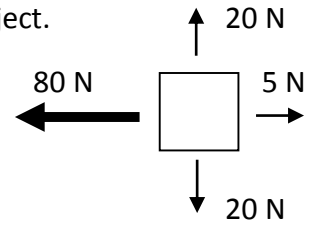
Force F: _____

Force G: _____

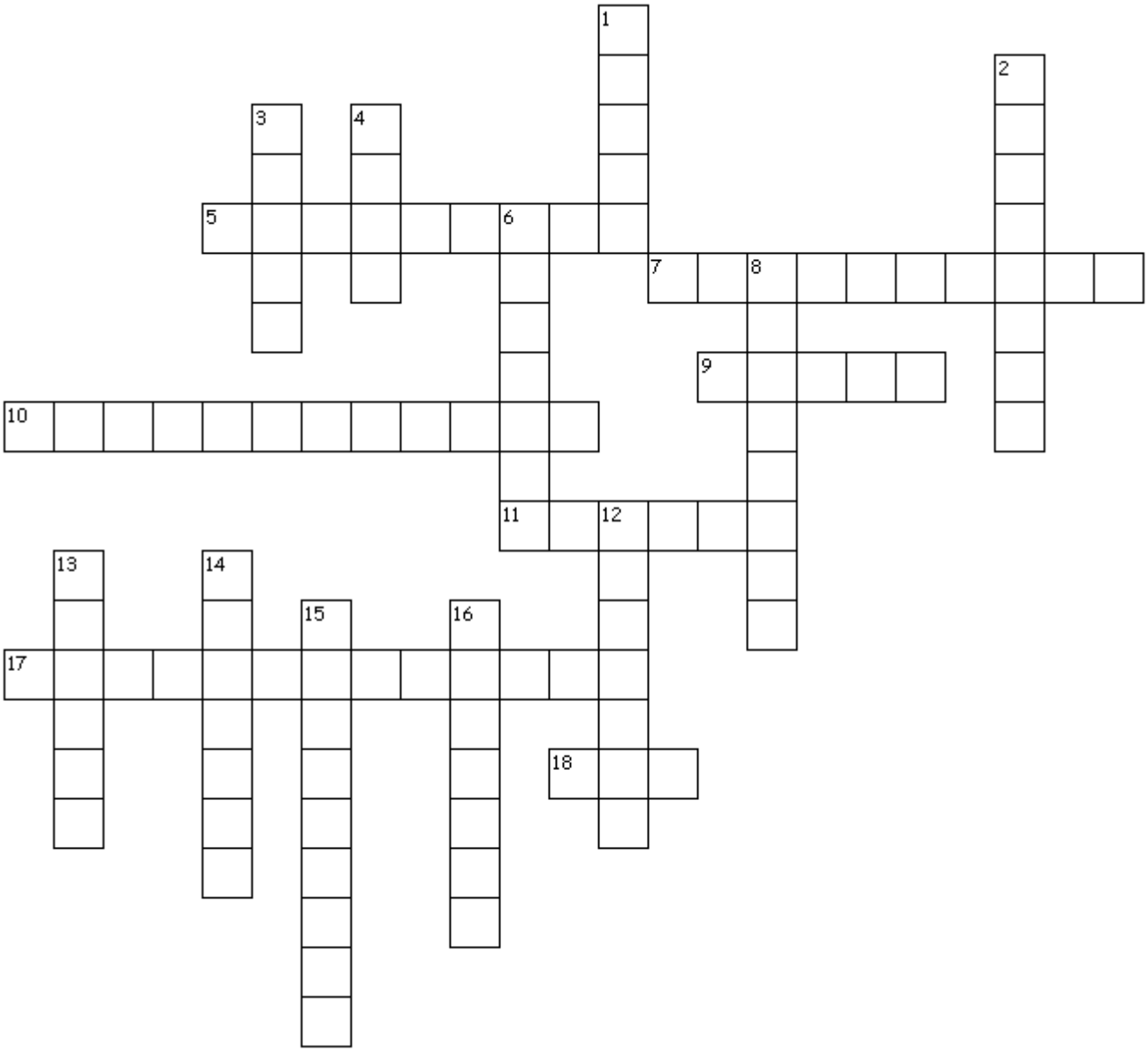
Force H: _____

21. A circus monkey is about to be shot from a cannon as part of his thrilling circus act. Draw a free body diagram labeling the forces (name them but don't worry about the strength) acting on him at the moment he is launched from the cannon.

22. Look at the following free body diagram and write a brief scenario of what could be represented by this diagram. Label the forces and determine the net force acting on the object.




23. Draw a free body diagram showing the forces acting on a paper rocket sitting on the launch pad (label the names and direction of the forces, but not the magnitude).



**Across**

5. a _____ point is needed to determine if something is in motion
7. a change in motion will occur if the forces are _____
9. the type of friction encountered while moving through water or air
10. the change of velocity over time
11. the friction that must be overcome in order to get something moving
17. the force of attraction that results because of the masses of objects
18. the overall force acting on an object

**Down**

1. a push or a pull
2. the speed of an object in a direction
3. the distance traveled in a certain amount of time
4. a _____ body diagram is used to show all the forces acting on an object
6. the units used to measure force
8. no change in motion will occur if the forces are _____
12. the force a person or object applies to another object
13. the support force that opposes gravity
14. the friction that occurs when your foot moves across the ground
15. the scientific word for the strength of a force
16. the type of friction that occurs between wheels and the ground