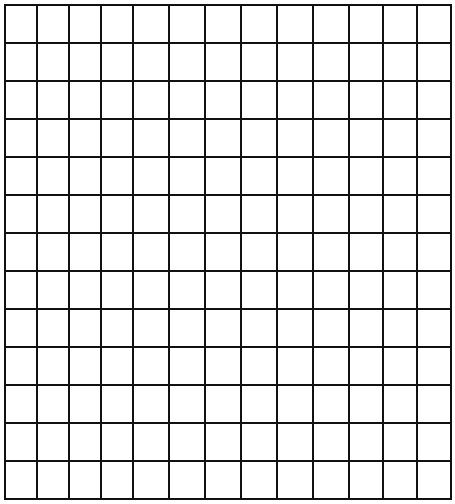
Forces & Newton's Laws

1. Given the following data:

distance (m)	0	1	2	3
Time (s)	0	3	12	27

Using the graph below calculate the acceleration.



2. Sketch a speed-time graph showing an object that is slowing down or decelerating.

3. Sketch a speed-time graph showing an object that is speeding up or accelerating.

4. At an acceleration of 2.0 m/s/s how long would it take an object to slow down from 10 m/s to 3 m/s?

5. How long would it tale a stone to fall from a cliff at a speed of 4.0 m/s? "Remember (a= 9.8 m/s/s)"

6. Define:

a. Static Friction: _____
b. Moving Friction: _____
c. Force of Gravity: _____
d. Force: _____
e. Terminal Velocity: _____
f. Coefficient Velocity: _____

7. A car is moving at a constant speed. Draw a diagram to show all forces acting on the car.

8. Newton's First Law states that: _____

An Example of this is: _____

9. Newton's Third :aw states that: _____

An Example of this is: _____

10. The force of gravity on an elephant is 20000 N. Its mass is:

11. The force on a soccer ball is 80 N when kicked. The mass of the ball is 1.2 kg. What is the acceleration?

12. The mass of a car is 1000 kg. The car moves with an acceleration of 1.5 m/s/s. What is the force on the car?

13. Force of friction depends on:

a. _____
b. _____
c. _____

14. An experiment to calculate friction was performed. These results were collected:

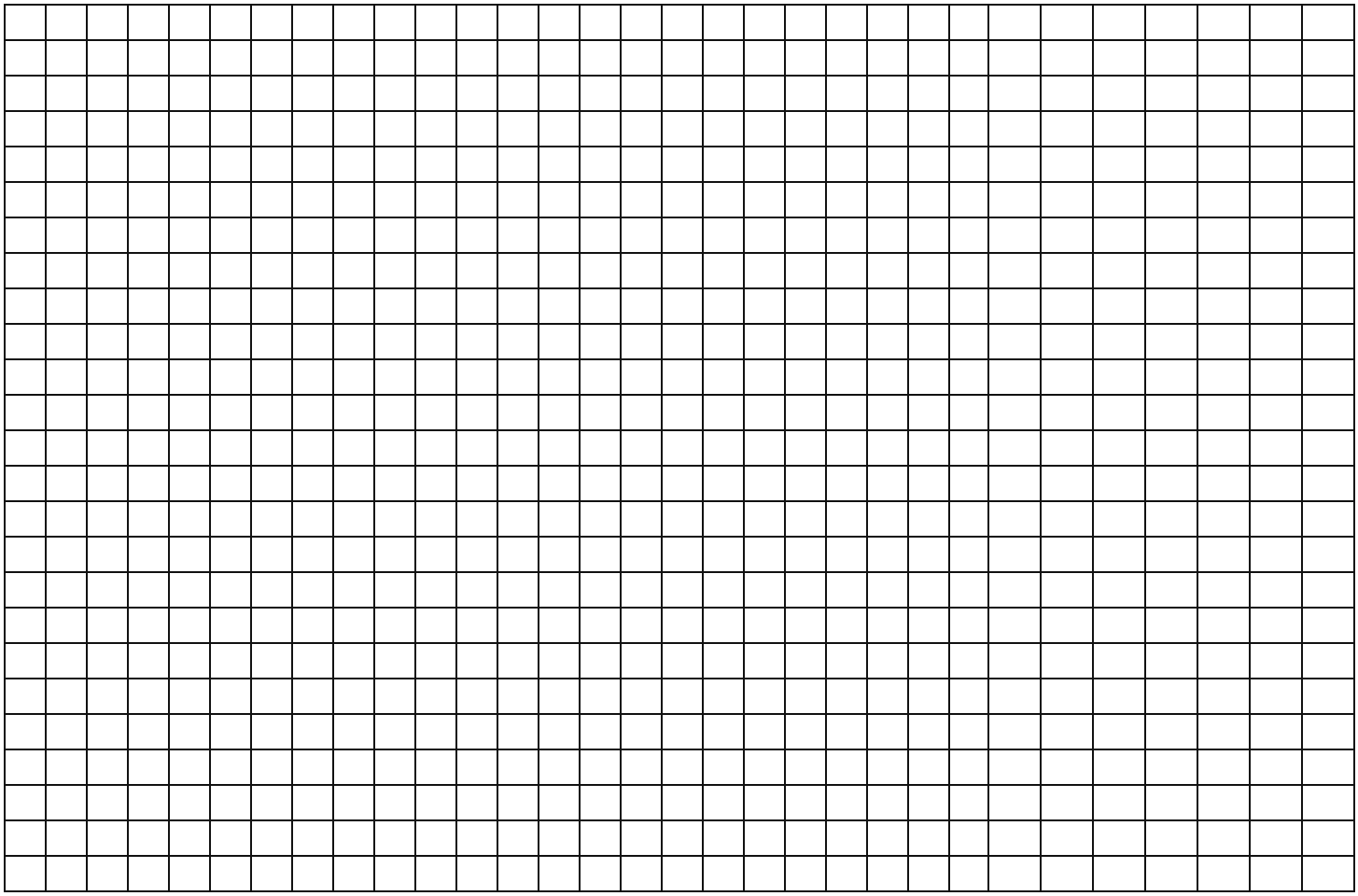
Surface A

Mass (kg)	Friction Force (N)
0.5	2.5
1.0	5.0
1.5	7.5

Surface B

Mass (kg)	Friction Force (N)
0.5	4.0
1.0	8.0
1.5	12.0

Use the graph below to plot the necessary points and then answer the questions on the questions that follow.



A. What is the coefficient of friction for Surface A?

B. What is the coefficient of friction for Surface B?

C. Which surface is rougher?

D. State the reason for your choice?

E. What would you see under a microscope if you looked at surface B?

F. Why does friction generate heat?