

**Worksheet**  
**How fast is that Rocket?**

Name \_\_\_\_\_

Date: \_\_\_\_\_

**Calculate the following using the formulas:**

*Assume all objects begin to fall at 0 meters per second.*

**Velocity =  $\frac{\text{distance traveled}}{\text{Time}}$  (in a particular direction)**

**Acceleration =  $9.8 \text{ m/sec}^2 \times \text{time}$  (Acceleration due to gravity)**

**Average Acceleration =  $\frac{\text{Final Velocity} - \text{Initial Velocity}}{\text{Time}}$  (assume initial velocity = 0)**

	Average Velocity	Average Acceleration
1. A penny falls 120 feet in 5 seconds.	_____	_____
2. A penny falls 1200 feet in ten seconds	_____	_____
3. A feather falls 234 feet in 15 seconds.	_____	_____
4. A car falls 400 feet in 4 seconds.	_____	_____
5. A penny falls 345 feet in 9 seconds.	_____	_____
6. A penny falls 3456 feet in 8 seconds.	_____	_____
7. A penny falls 342 feet in 2 seconds.	_____	_____
8. A car falls 4567 feet in 9 seconds.	_____	_____
9. An orange falls 2345 feet for 5 seconds.	_____	_____
10. A dime falls 500 feet in 5 seconds.	_____	_____
11. A car falls 456 feet in 3 seconds.	_____	_____
12. A plane falls 600 feet in 4 seconds.	_____	_____
13. A plane falls 500 feet in 3 seconds.	_____	_____
14. A plane falls 345 feet in 2 seconds.	_____	_____
15. A plane falls 4567 feet in 6 seconds.	_____	_____
16. A plane falls 3452 feet in 3 seconds.	_____	_____
17. A plane falls 5678 feet in 4 seconds.	_____	_____
18. A plane falls 45678 feet in 6 seconds.	_____	_____
19. A plane falls 345678 feet in 8 seconds	_____	_____
20. A plane falls 3456 feet in 4 seconds.	_____	_____

**Data Collection Sheet**  
**How Fast is that Rocket?**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Procedure:**

1. The teacher will launch three rockets using three engine sizes.
2. Students need to time each rocket from the release of the top cap until each rocket reaches the ground.
3. In theory, the acceleration rate will be the same for each rocket launched although the rockets reach different heights.
4. You will be given the height of the rocket obtained from the data on the engine packet. Record the height of each rocket launched.
5. Go back to class and calculate the speed and final velocity of each rocket.
6. Compare the height of each rocket with the final velocity of each rocket.
7. Compare your answers with your classmates. You will be asked to report your data from your data sheet for the teacher to record on the board or on the overhead transparency.
8. The class will discuss the results and compare the data to the acceleration of gravity.
9. Draw conclusions based on the information and record these conclusions on your data sheet.

Collect the data and place it in the appropriate place: (Initial Velocity will be zero. Final Velocity can be calculated using distance and time.)

Rocket One	Distance Traveled _____ Speed _____	Time Traveled _____ Velocity _____
Rocket Two	Distance Traveled _____ Speed _____	Time Traveled _____ Velocity _____
Rocket Three	Distance Traveled _____ Speed _____	Time Traveled _____ Velocity _____

**Formulas:**

**Average Speed =  $\frac{\text{Distance traveled}}{\text{Time}}$**

**Final Velocity =  $9.8\text{m/sec}^2 \times \text{time traveled}$  (due to gravitational forces)**

**Average Acceleration =  $\frac{\text{Final Velocity} - \text{Initial Velocity}}{\text{Time}}$  (assume initial velocity = 0)**

**Gravitational Constant = 9.8 meters per second per second**