Teach a parent: Today's concept :
Teach your parents about the 4 different types of friction!
Help your parent become an expert !
Be sure they write what they have learned from your teaching

Parent Response

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   Please work with him/her and let's try again.
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   "By golly, I think they've got it!"
3. _____ WOW! My child did an exceptional job! It was logically explained, therefore I caught on immediately and feel confident about teaching it to others. The self-created examples were a perfect fit. My child even asked me a question at the end to make sure I understood.
I believe my child could effectively teach this concept to others.

Parent Signature:_____ Date: _____

Mom or Dad Comments: Please explain how your student taught you this concept and * <u>what you learned in 3-5 sentences!</u> * This is critical for them to receive full points

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Additional notes:

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Matter in Motion

Sci Number:

Chapter 5

Draw or have tiny downloads showing the following examples

Force	Unbalanced force
Balanced force	Net force
Weight vs mass	Projectile motion
Different types of friction:	

Name: _____ Sci Number: ___ period:__
Parent Sig_____

Vocabulary: Section 1 & 2

Word/pg	Definition: Book or your words
motion	
Speed	
Velocity	
acceleration	
force	
Newton(N)	
Net force	

Penny's Puns

After you finish Chapter 5, give this puzzle a try!

Oh no! Penny Punster's computer mixed up her physical science dictionary with her dictionary of puns. The computer paired the terms related to forces with her goofy definitions, and it paired her pun-related terms with the real definitions. Help Penny unscramble the mismatched pairs and get her dictionaries back in order. The first one has been done for you!

c 1. **farce**: a push or pull

____ 2. **grubby tea**: force of attraction between objects with mass

____ 3. **freak sheen**: force opposing motion between touching surfaces

____ 4. **fellow's city**: speed in a particular direction

____ 5. **sty tic**: friction that disappears when an object starts moving

____ 6. **exhilaration**: rate at which velocity changes

____ 7. **mow shun**: changing position over time

____ 8. **spyed**: rate at which an object moves

____ 9. **bell lanced**: forces producing a net force of zero

____10. **net for us**: result of combined forces on an object

____11. **wade**: measure of the force of gravity on an object

____12. **mace**: amount of matter in an object

____13. **roe link**: friction between wheels and the floor

____14. **Libra can't**: reduces friction

____15. **flu ad**: friction that slows down a swimmer

____16. **now ten**: unit used to express force

____17. **sly ding**: friction that makes brakes work

a. **balanced**: a ringer on a stick

b. **newton**: used to be nine

c. **force**: slapstick

d. **fluid**: influenza commercial

e. **motion**: lawn-cutting avoidance

f. **gravity**: dirty English drink

g. **velocity**: guy's town

h. **net force**: mesh that's ours

i. **static**: pigpen twitch

j. **mass**: spiked medieval war club

k. **friction**: weird shininess

l. **acceleration**: thrill

m. **weight**: slowly walk into the water

n. **speed**: played secret agent

o. **sliding**: sneaky dent

p. **lubricant**: the sign between Virgo and Scorpio won't work

q. **rolling**: fish egg connection

A Weighty Problem

Complete this worksheet after you finish reading Chapter 5, Section 4.
Pictured below are two measurement devices, *A* and *B*.

Weight or Mass?	Weight or Mass?

A.

B.

1. Determine whether each device measures *mass* or *weight,* and circle the correct term in each box.
2. The following list contains information that relates to either *mass* or *weight.* Write each of the bulleted items in the correct boxes above. Some information may go in more than one box.

- balance
- spring scale
- measure of gravitational force exerted on an object
- amount of matter in an object
- constant on Earth
- measured in grams
- changes when gravitational force changes
- never changes
- expressed in newtons
- remains the same when gravitational force changes
- six times less on the moon than on Earth

1.On pg 106. Why is lacrosse a good example of physics in action?

_____
_____
_____

Section 1: Measuring Motion (pages 108-114)

2.You might think that the motion of an object is easy to detect - you just have to _____ the object. But there's more to it than that! You actually must observe the object in relation to another object that appears to _____. The object that appears to stay in place is a _____. When an object changes position over time, when compared with a reference point, the object is in _____.

3.Look at the pictures on the bottom of pg 108. What do they tell you?

_____
_____
_____

4.Name something in motion that you can't see moving.

_____

5.Why do we generally calculate average speed?

_____
_____
_____

6. If you take a walk for 1.5 hours and travel 7.5 km, what is your average speed? _____

7. How is velocity different from speed?

_____
_____
_____

8. What is the equation for acceleration?

9. Match the word with the correct definition by drawing a line to connect the two.

Acceleration	Speed in a given direction
Deceleration	Rate at which velocity changes
Speed	Rate at which an object moves
Velocity	Rate at which velocity decreases

10. A coconut falls from the top of a tree and reaches a velocity of 19.6 m/s when it hits the ground. It takes 2 seconds to reach the ground. What is the coconut's acceleration? _____

11. Copy the graph on page 114 into the box below. Then, draw a graph showing deceleration next to it.

Graph Showing Acceleration	***Graph Showing Deceleration***

Additional section 1 notes:

Chapter Tour: Gravity Chapter 5, Section 4 – pages 125-129

1. How does gravity affect motion on the moon?

2. True or False: All matter experiences gravity, so all objects experience an attraction towards all other objects. Explain:

3. If all objects are being pulled toward you and each other because of gravity on Earth, why don't you notice objects moving towards one another?

4. Newton generalized his observations on gravity in a law known as the law of _____. The law describes the relationships between gravitational _____, _____, and _____. It is called universal because it applies to all objects in the universe, from the tiniest speck of _____ to the largest _____.

5. Copy figure 20 into your notebook & include the labels a-c.

6. How does the mass of an object relate to the gravitational force the object exerts on other objects?

7. How does the distance between objects affect the gravity between them?

8. What is the difference between mass and weight?

5. Give an example of the 4 types of friction listed below:

Sliding: _____

Rolling: _____

Fluid: _____

Static: _____

6. Name two ways that friction is harmful and two ways that friction is helpful to you when riding a bicycle.

Additional section 3 notes:

WORKSHEET 47

MATH IN SCIENCE: PHYSICAL SCIENCE

MATH SKILLS USED
Addition
Subtraction
Multiplication
Division
Averages
Decimals
Percentages

Average Speed in a Pinewood Derby

Determine the average speeds of a Pinewood Derby car.

Cindy and Santiago have just finished building model cars for their school's annual Pinewood Derby. In order to test their cars, Santiago sets Cindy's car at the top of a 240 cm long ramp and releases it. Cindy uses a stopwatch to measure how long it takes the car to reach the bottom of the ramp. The two decide to conduct three trials for each car and then calculate the overall average speeds. Cindy recorded her initial results in the table below.

Cindy's Car

Trial	Time (s)	Average speed (cm/s)
1	8	
2	10	
3	8	

The Race Is On!

1. Complete the third column of the chart, and show your work below.

2. What was the overall average speed of Cindy's car?

3. Santiago's car has an overall average speed of 25 cm/s. If he could increase his car's overall average speed by 10%, what would his car's new overall average speed be?

4. By adding lubricant to the wheels of his car, Santiago determines that he can increase his car's average speed to 29.5 cm/s. What percentage increase does this represent?

Section 2: What is a force? (pages 115-118)

12. A _____ is a push or pull and is measured with a unit called the _____.

13. What are 3 examples of different forces?

_____

_____

_____

14. Copy figure 8 & figure 9 in the two boxes below – as best you can. Be sure to label the forces.

Fig 8: Forces in the Same Direction	Fig 9: Forces in Different Directions

15. a) What is the net force when you combine a force of 7 N south with a force of 5 N north? _____

b) What is the net force when you combine a force of 15 N east with a force of 22 N east? _____

	Definition	Produces a change in motion?	Example
Balanced Forces			
Unbalanced Forces			

Vocabulary: Section 3&4

Word/pg	Definition: Book or your words
friction	
gravity	
weight	
mass	

Friction: Chapter 5, Section 3 – pages 119-124

1. Read the top two paragraphs on page 119. "The painful difference between sliding on grass & sliding on pavement has to do with _____.

2. Friction is a _____ that opposes _____ between two _____ that are touching."

3. What causes friction (figure 11)?

_____

_____

_____

_____

4. Name two ways in which friction can be increased.

_____

_____

Teach a parent: Today's concept :
Teach your parents about speed , velocity & acceleration!
Work on the worksheet pages 8 & 9 together

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Additional notes:

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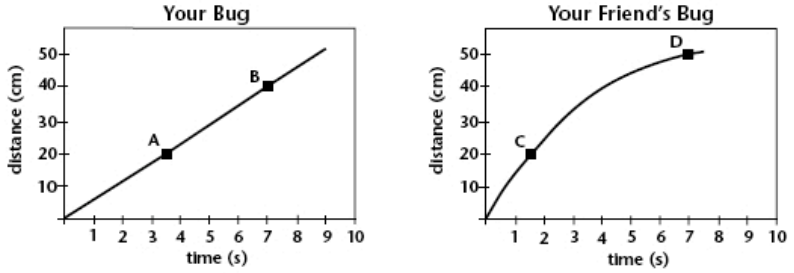
Bug Race

Complete this worksheet after you finish reading Chapter 5, Section 1.
You and a friend are having a bug race. You measure the distance your pet bugs travel along a straight race track and record their time as they race. The results are plotted in the graphs below. Take a look at the two graphs. Then answer the questions that follow.



1. Look at Point A. What distance has your bug traveled so far? _____
2. How long did it take your bug to travel that distance? _____
3. To determine your bug's average speed while traveling from the starting line to Point A, divide the distance traveled by the time it took to travel that distance:

   $\text{average speed} = \frac{\text{distance traveled}}{\text{elapsed time}} =$ _____
4. Now look at Point B. What is the distance from Point A to Point B? _____
5. How long did it take your bug to travel from Point A to Point B? _____
6. Calculate your bug's average speed from Point A to Point B.

   _____
7. Compare the graphs of your bug and your friend's bug. Which bug was traveling at a constant speed? Explain.

   _____

   _____

Additional section 2 notes:

_____
_____
_____
_____
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Motion Math

Be sure to put the units & SHOW WORK for full credit

Solve the following problems. Show all your work and attach additional paper if necessary. Write the formulas in the provided boxes to help. Remember to include the correct units.

Speed Formula:

Speed & Average Speed

1. Nascar driver, Jeff Gordon, has a car that is one of the fastest on the circuit. If it travels 600 miles in 4 hours, what is his cruising speed?

2. The fastest car on Earth, a German-made Thrust SSC, would win every Nascar race in America. If it takes 0.5 hours (30 minutes) to travel 380 miles, what is its speed?

3. The fastest train on Earth, the TGV from France, can travel at faster speeds than trains in the United States. During a speed test, the train traveled 800 miles in 2.5 hours. What is its speed?

4. How fast was a plane flying if it traveled 400 km in 30 min?

5. A Hummer travels at a speed of 50 mi/hr for 4 hrs. How far did the car travel?

6. The fastest plane ever made, the Lockhead SR71, was able to travel 2200 miles per hour. Based on this speed, how far could it travel in:
   a. 2 hours?

   b. 3 hours?

   c. 5 hours?

Velocity Formula:

Velocity

7. A car traveled 1025 km from El Paso to Dallas in 13.5 hr. What was its average velocity?

8. A student walks 10 blocks to a computer store (Assume all the blocks are equal length.)
   a. How long will it take him to reach the computer store if he walks 3 blocks in 2 min?

   b. What is his average velocity?

9. A cheetah runs at a velocity of 88 ft/sec for 40 seconds. How far does this cheetah run?

Acceleration Formula:

Acceleration

10. Twenty seconds after a soccer ball is kicked (initial velocity = 0), its velocity is 32 m/s. What is its acceleration?

11. A driver starts his parked car and within 1 minute reaches a velocity of 30 mph as he travels east. What is his acceleration?

Random – Find the missing variable

12. V = 40 mi/hr t= 3 hrs. D=?

13 A = 9.8 m/s^2 t= 3 hr V=?

14. t = 5 hr d= 100 m. V=?

15. V = 100 mi/hr d= 400 mi t= ?