ASCEND
BREAK WORK PACKET
FOR 8TH GRADE

Dear Families,

In this packet, you'll find math and science activities for scholars to complete over the break. The activities are meant to challenge your scholar's thinking, while also being fun and   . engaging.

Our scholars have had a busy a year learning new math skills; mastery of these skills is extremely important in developing a solid math foundation. Our continuing math program will build onto these skills, so any time spent learning or reinforcing these concepts over the break, and completing the practice pages in the packet, will be very beneficial for your child. The science activities included will reinforce the work your scholar has been doing in science.

Thank you for supporting your scholar's learning. Together, we can push them to new heights!

Ascend Public Charter Schools

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8 TH GRADE MATH

This math packet has been designed so that you will review and maintain your math skills during the break. The packet is divided into weekly sections. Complete one section a week. Please monitor your progress so that you are completing work on a weekly basis and not at the last minute on the day before school re-starts.

HELPFUL WEBSITES:

http://www.khanacademy.org/

http://www.aplusmath.com

http://funbrain.com

http://aaamath.com

http://math.com

HELPFUL APP:

"Virtual Nerd Mobile"

Requirements: iOS 6.0 or later; compatible with iPhone, iPad, and iPod Touch

Features: Virtual Nerd's on-screen instructors provide clear and approachable explanations; students can mark "favorite" videos so that they can instantly return to them in the future.

Price: Free

Week 1

Complete the statement using <, >, or =.

1. $|-6|$ __?__ 6 2. 0 __?__ $|3|$ 3. $|-5|$ __?__ $|-9|$

4. One fish is 4 feet below sea level. Another fish is 3 feet below sea level. Write each position as an integer. Which integer is greater?

Add.

5. $6 + (-3)$

6. $8 + (-1) + (-3)$

7. You start hiking at an elevation that is 80 meters below base camp. You increase your elevation by 42 meters. What is the new elevation with respect to base camp?

Subtract.

8. $10 - (-3)$

9. $-9 - (-9)$

10. The temperature falls from 3°C to −4°C. What is the difference in these temperatures?

Multiply.

11. $7 \cdot (-4)$

12. $-2(-5)(-3)$

Divide, if possible.

13. $-12 \div (-4)$

14. $-18 \div 6$

15. $\dfrac{-16}{8}$

16. $0 \div (-10)$

Evaluate the expression when $r = -7$, $s = 2$, **and** $t = -5$.

17. $s + t$

18. $t + s - r$

19. $s^2 - rt$

20. $\left| \dfrac{r+1}{s} \right|$

Use mental math to solve the equation.
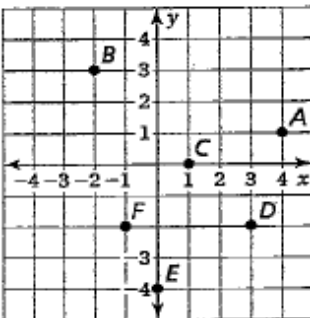
21. $n + (-8) = 5$

22. $8 - d = 14$

Find the next two numbers in the pattern.

23. $6, -12, 24, -48, \ldots$

24. $-2, 20, -200, 2000, \ldots$

25. The table shows the temperature in Des Moines, Iowa, for certain times during a particular day.

Time	3 A.M.	8 A.M.	1 P.M.	5 P.M.	10 P.M.
Temperature	−15°F	−6°F	22°F	10°F	−11°F

   a. What are the high and low temperatures for the day?

   b. Find the range of temperatures for the day.

   c. Find the change in temperature from 5 P.M. to 10 P.M.

   d. Based on the given five temperatures, what is the average temperature for the day?

   e. Explain why your answer to part (d) is not an accurate average temperature for the day.

26. Write an ordered pair corresponding to the point.

   a. Point A b.   Point B

   c. Point C d.   Point D

   e. Point E f.   Point F

27. Which point in Exercise 26 is located in Quadrant III?

28. The pool is located at $(0, 0)$.

    a. To get to your house from the pool, you walk 3 blocks west and 1 block north. What ordered pair corresponds to the location of your house?

    b. What quadrant is your house located in?

Week 2

Write the rational number as a decimal.

1. $-\dfrac{3}{11}$

2. $-3\dfrac{13}{20}$

Write the decimal as a fraction or mixed number in simplest form.

3. 3.42

4. -0.35

5. Your skateboard ramp is $2\dfrac{3}{8}$ feet high. Your friend's skateboard ramp is $2\dfrac{2}{5}$ feet high. Which skateboard ramp is higher?

Add or subtract. Write fractions in simplest form.

6. $5.73 - (-3.56)$

7. $-\dfrac{5}{3} + 2\dfrac{1}{3}$

8. A gallon jug of milk is $\dfrac{3}{4}$ full. After breakfast the jug is $\dfrac{1}{12}$ full. Find the difference of the amounts before breakfast and after breakfast.

9. You buy a bag of dog food for $12.59 and a bottle of dog shampoo for $4.75. How much more did the dog food cost than the shampoo?

Multiply. Write fractions in simplest form.

10. $\left(-\dfrac{2}{5}\right)\left(-1\dfrac{1}{4}\right)$

11. $0.15 \times (-0.6)$

Divide. Write fractions in simplest form.

12. $-4.2 \div 12$

13. $-\dfrac{2}{7} \div \left(-\dfrac{8}{21}\right)$

14. How many $\dfrac{2}{3}$-ounce packages of peanuts can be made with 8 ounces of peanuts? Explain how you found your answer.

Solve the equation. Check your solution.

15. $n - 6 = 21$

16. $-8.3 = d + 4.7$

17. $p + 1\dfrac{3}{4} = 4\dfrac{5}{8}$

18. $-2 = \dfrac{w}{-5}$

19. $5h = 40$

20. $-0.5x = -4.3$

Write the verbal sentence as an equation. Then solve.

21. 6 more than a number w is 2.

22. The product of $\frac{3}{4}$ and a number s is $\frac{3}{5}$.

Write an equation for the situation. Then solve.

23. The temperature is $-4°$F. A high pressure front increases the temperature to $8°$F. By how many degrees did the temperature increase?

24. One eighth of the students in the seventh grade are in the school band. There are 44 students in the school band. Find the number of students in the seventh grade.

Solve the equation. Check your solution.

25. $3d - 8 = 13$

26. $-7 = \frac{z}{2} + 1$

27. $2y - 3y = 5$

28. $-2.9 = 3f + 4.3$

29. A rectangular garden has a length of 12 feet. You need 36 feet of fencing to enclose the garden. What is the width of the garden? Explain how you found your answer.

Week 3

Write the ratio as a fraction in simplest form.

1. 15 girls to 6 boys

2. 24 players : 3 teams

Find the unit rate.

3. 405 rotations in 5 minutes

4. 72 ounces for 12 servings

Tell whether the ratios form a proportion.

7. $\dfrac{8}{24}, \dfrac{5}{15}$

8. $\dfrac{3}{7}, \dfrac{12}{21}$

9. You can buy 5 stickers for $3. Write a proportion that gives the cost c if you buy 12 stickers.

Solve the proportion.

10. $\dfrac{2}{3} = \dfrac{n}{12}$

11. $\dfrac{33}{p} = \dfrac{3}{28}$

12. $\dfrac{k}{6} = \dfrac{15}{18}$

13. $\dfrac{2}{3} = \dfrac{3}{q}$

Copy and complete the statement. Round to the nearest hundredth, if necessary.

14. 3 in. ≈ _?_ cm

15. 4 L ≈ _?_ qt

16. 30 mi/h ≈ _?_ km/h

17. 40 oz ≈ _?_ kg

18. Use the table to find the rate.

Quarters	2	3	4	6
Minutes	30	45	60	90

19. Your baseball team has won 6 games and lost 4 games. If the team does not lose any more games, how many games must the team win to have a win : loss ratio of 2 : 1? Explain your answer.

20. It costs $145 for 10 people to attend a concert. How much does it cost a group of 8 people?

21. The weekly cost per person to rent a cottage on a lake varies inversely with the number of people who share the cost. When four people share the cost, each one pays $312.

   a. Write an equation relating the cost per person c and the number n of people who share the cost.

   b. If six people share the cost instead of four, how much does the cost per person decrease?

Week 4

Write and solve an equation to answer the question.

   1. 17 is what percent of 68?   **2.** What number is 16% of 80?

   3. 35% of what number is 21?   **4.** 70 is what percent of 56?

Identify the percent of change as an *increase* or *decrease*. Then find the percent of change. Round to the nearest tenth of a percent, if necessary.

   5. 15 books to 21 books   **6.** 60 cars to 24 cars

   7. 12 calculators to 3 calculators   **8.** 100 pennies to 101 pennies

Use the percent of change to find the new amount.

   9. 40 employees increased by 15%   **10.** 120 pounds decreased by 30%

   11. $84 increased by 12%   **12.** 820 brushes decreased by 25%

21. The percent of sales tax is 6%. What is the sales tax on a skateboard that costs $98?

22. The price of your favorite brand of jeans was $35 last month. This month the price is $42. What is the percent of change from last month to this month?

23. You are shopping for a cell phone. At which store should you buy the cell phone? Explain your answer.

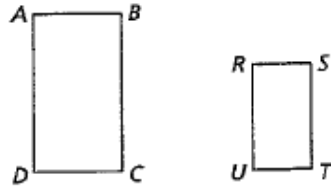| Store	Original Price	Discount
A	$129	30%
B	$135	35%
C	$150	40%

24. You deposit $200 in an account earning 3.5% simple interest. How long will it take for the balance of the account to be $221?
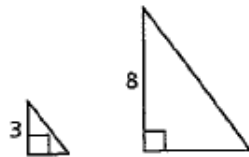
Week 5

Name the corresponding angle or the corresponding side of the similar figures.
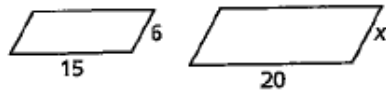
1. $\angle B$

2. Side CD

3. The two figures are similar. Find the ratio (small to large) of the perimeters and of the areas.

4. The polygons are similar. Find the value of x.

Find the missing dimension. Use the scale factor 1 : 8.

5. Model length: 6 cm

   Actual length: __?__

6. Model height: __?__

   Actual height: 28 in.

7. Your rectangular vegetable garden is 12 feet long and 8 feet wide. Your friend's rectangular vegetable garden is 15 feet long and 10 feet wide. Are the gardens similar?

8. The ratio of the corresponding side lengths of two similar MP3 players is 4 : 3. The area of the larger MP3 player is 8 square inches. What is the area of the smaller MP3 player?

9. The ratio of the side length of square A to the side length of square B is 3 : 5. The perimeter of square B is 60 feet. What is the area of square A?

10. The scale on a map is 1 in. : 50 mi. The actual distance between two cities is 350 miles. What is the distance between the cities on the map?

11. Find the surface area of the rectangular prism.

12. Find the volume of the rectangular prism.

14 in.

10 in.

8 in.
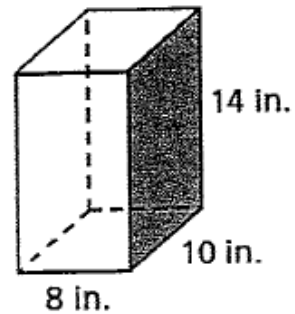
13. Find the surface area of the cube.

14. Find the volume of the cube.

12 in.

12 in.

12 in.
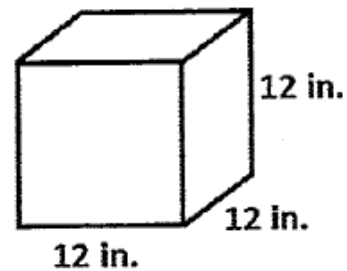
Week 6

1. Joey is putting all of his trophies onto 7 shelves. If he places 6 trophies on each shelf but still has 2 trophies left over, how many trophies does he have?

2. Angie read 3 books in 4 days, and each book contained 280 pages. If Angie read the same number of pages each day, how many pages did she read per day?

3. Mike put 304 baseballs into 8 trash bins. He put the same number of baseballs in each bin. He took 5 trash bins of baseballs to the baseball field. How many baseballs did Mike take?

4. Workers Inc. just bought 14 boxes of pens to put in their storage room for employees to use as needed. Each box contains 50 pens. If each of the 33 employees working for Workers Inc. takes 4 pens when they are first brought into the office, how many pens will be left in the storage room?

5. John has 9 boxes of apples. Each box holds 16 apples. If 7 of the boxes are full, and 2 of the boxes are half full, how many apples does John have?

6. The temperature outside is -5°F, and the wind chill is -12°F. What is the difference between the temperature and the windchill?

7. Jena has a rope that is $4\frac{1}{4}$ inches long. If she divides the rope into sections that are exactly $\frac{1}{4}$ inch in length, how many $\frac{1}{4}$–inch sections will she have?

8. Mrs. Jones decided to buy some pencils for her class. She bought 3 packages of pencils, and each package contained 72 pencils. There are 24 students in her class and she divided up the pencils so that each student had the same amount of pencils. If there were no pencils left over, how many pencils did each student get?

9. Griffin ordered a pair of sneakers online. He had a $16 credit that he applied toward the purchase, and then he used a credit card to pay for the rest of the cost. If the shoes cost $80, how much did Griffin charge to his credit card when he bought the sneakers?

10. Caleb had 27 video games. He bought 8 more from a garage sale. He then sold $\frac{1}{35}$ of his games to a used video game store. How many video games did he sell?

11. For a scavenger hunt, Jim's mom distributed a bag of 725 jelly beans evenly into 29 plastic containers and hid them around the yard. If, after the hunt, Jim has a total of 275 jelly beans, then how many of the plastic containers did he find?

12. Sandra, Robert, and some other friends had a total of $73. Sandra spent $28 on videos and Robert spent $14 on videos.

How much money did the group have after Sandra and Robert bought the videos?

13. Jimmy is writing a paper for one of his classes. The paper has to be 3,000 words long, and so far he has written 696 words. If he only has 6 more days to write his paper and wants to write the same number of words each day, then how many words must he write per day to finish the paper?

14. Lindsey went skydiving. When she jumped out of the plane, its elevation was 13,000 feet. She was in free fall for 10,000 feet, and then she deployed her parachute. At what elevation did Lindsey deploy her parachute?

15. On his bookshelf, Adam has the difference between two-thirds of Brett's books and two thirds of Charlie's books. If Brett has 72 books and Charlie has 27 books, how many books does Adam have?

16. Fredo has a coupon for $1.00 off the price of a loaf of bread at the grocery store. After he arrived at the store, he found out the bread had already been marked down $2.00. What is the total discount on the price of the bread?

17. Carla, Patricia, and Angelina went on a car trip together, and they took turns driving. When they reached their destination, Carla and Patricia had driven a total of 259 miles, and Angelina and Patricia had drive a total of 255 miles.

If Carla drove 101 miles, who drove the most miles?

18. The temperature of a city at sunset was -3°F. Overnight, the temperature decreased by 13°F. What was the lowest temperature overnight in that city?

19. A pet store sold 245 cans of cat food last weekend for a total of $90.65. What was the price per can?

20. Sam, James, and Leonard participated in a fundraiser for their school.

Sam sold 23 candles. Together, Sam and James sold 51 candles. Together, James and Leonard sold 54 candles.

How many candles did Leonard sell?

Week 7

The stem-and-leaf plot at the right shows the lengths (in inches) of some snakes.

1. How many data values are in the set?

Stem	Leaf
0	3
1	1 3 3
2	0 3 7 8
3	3
4	5 6 7 9

Key: 1|5 = 15

2. Find the least value and the greatest value.

3. What is the median?

4. What is the range?

5. Which value occurs the most often?

6. Is the value 31 in the set? Explain.

7. Display the data in a histogram.

Books Read	
Books	**Frequency**
0–3	6
4–7	7
8–11	6
12–15	5

11. Identify the population and the sample.


2 cell phones

Cell phones in shipment

12. Which sample is better for making a prediction? Explain.

Predict the amount of nitrates in the river.

Sample A: A random sample of 5 gallons of water from one location in the river

Sample B: A random sample of 5 gallons of water from five different locations in the river

In Exercises 13–15, use the histogram that shows the number of songs downloaded per week by students in a class.
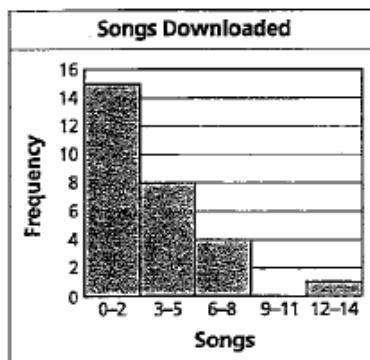
Songs Downloaded

13. Which interval contains no data values?

14. How many students are in the class?

15. What percent of the students downloaded fewer than 6 songs? Round to the nearest tenth.

In Exercises 16–20, use the circle graph that shows the results of a shoe store's survey on favorite color of shoes.

Color of Shoes

16. Which color is the most popular?

17. Which two colors were chosen the same number of times?

18. Forty adults were surveyed. How many adults chose brown?

19. Find the angle measure that corresponds to the percent of shoes that are *not* brown.

20. Predict the number of customers out of 250 who would choose red as their favorite color.

Week 8

**You randomly choose one of the tiles shown. Find the favorable outcomes of the event.**

1. Choosing an odd number less than 4

2. Choosing a number less than 1

3. Choosing a number divisible by 4

You randomly choose one of the tiles shown above. Determine the theoretical probability of the event.

4. Choosing an even number greater than 7

5. Choosing a negative number

6. Choosing a number divisible by 3

You randomly choose one shape from the bag. (a) Find the number of ways the event can occur. (b) Find the favorable outcomes of the event.

7. Choosing a square

8. Choosing a circle

9. *Not* choosing a star
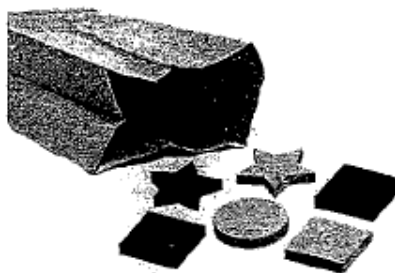
In Exercises 10 and 11, use the following information.

You check 20 batteries. Fourteen of the batteries <u>do not</u> have a charge.

9. What is the experimental probability that the next battery you check does not have a charge?

11. Out of the next 70 batteries that you check, how many would you expect to not have a charge?

You throw two sticks 15 times and record the results. Use the table to find the experimental probability of the event.

12. Tossing 2 blue

13. Tossing 1 blue and 1 pink

Outcome	Frequency
2 blue	4
2 pink	3
1 blue, 1 pink	8

14. *Not* tossing all blue

15. You have 160 songs on your MP3 player. The probability of randomly choosing a rock song is 30%. How many of the songs on your MP3 player are *not* rock songs?

Tell whether the events are *independent* or *dependent*. Explain.

16. You flip a coin twice.

First Flip: You flip tails.   Second Flip: You flip tails.

17. Two students are selected to serve on the student council.

First Choice: You are chosen.   Second Choice: Your friend is chosen.

A spinner has 4 equal sections numbered 1 to 4. You spin it twice. Find the probability of the events.

18. Spinning a 2 and then an even number

19. Spinning an odd number and then another odd number

A game has a deck of cards with 10 red cards, 4 blue cards, and 2 yellow cards. You randomly choose two cards. Find the probability of choosing the given cards.

20. two red cards

21. a blue card and a yellow card

8TH GRADE SCIENCE

Activities to do over the break:

- Density and Water
- Cell Choice Board
    - Choose one option from the cell choice board.
    - Review cells this summer.
    - Explain cells to your family.
- How Cup Material Affects Water Temperature
    - Complete the experiment.
    - Research "insulators" at your local library or on the internet with an adult.
    - Write a paragraph explaining why some materials are used for winter coats over others.
- Review weathering and erosion
    - Read the articles provided about weathering and erosion.
    - Complete the exploration "Demonstrating Water Erosion of Land Masses"
        - Why is this model an example of erosion and not weathering?
        - How would you make a model of weathering?
- Read "The Eco Pyramid" by Michael Stahl
    - Write a constructed response answering, "What is the author trying to teach you?"
    - Create a food pyramid or a food web using animals in a forest. Then try using animals in a pond. How are they similar? How are they different?

Science Books

Look for these great books about science at your local library.

Titles	Author	Topic
Trailblazers: 33 Women In Science Who Changed The World	Rachel Swaby	Learn the untold story of 33 different women in science.
Extreme Scientists: Exploring Nature's Mysteries From Perilous Places	Donna M. Jackson	Learn about extreme scientists, ranging from those who explore everything from caves to trees, and all sorts of daredevils!
How To Build Robots	Louise Derrington	Learn how to build robots in this easy-to-use book.
The Basics Of Cell Life With Max Axiom, Super Scientist	Amber Keyser	Review cells through this fun graphic novel.

Density and Water

Density is the amount of particles or atoms packed into a substance. The more tightly packed together the particles are, the denser the substance is.

Density shows the relationship of an object's **mass** to its **volume**. In other words, density refers to how many particles or atoms fit into a space. The more atoms in the space, the denser the substance is.

If you have two objects of the exact same size (volume), the denser object will have a greater mass than the less dense object.

There are two things contributing to density:

- The mass of the **atoms** or **molecules** that makes up the material.
- The volume or amount of space the material takes up.

If the molecules or atoms are packed tightly, the substance will be denser.

The density of water is 1 gram per milliliter or 1 gram per cm^3.

Let's experiment so we can see how density works!

Will a can of regular soda sink or float in a tank of water? Will a can of diet soda sink or float in the same tank of water?

Supplies

- 1 clear tank or bucket of water filled ¾ of the way to the top (it must be deep enough to submerge the soda can)
- 1 can of diet soda
- 1 can of regular soda of the same brand

Make a Prediction

What do you think will happen when you place the two soda cans in the bucket of water?

Directions

1. Examine the ingredients on the side of each can.
2. Note the volume of soda in each can.
3. Gently place the can of regular soda into the bucket of water.
4. Gently place the can of diet soda into the bucket of water.

More worksheets at www.education.com/worksheets

education.com
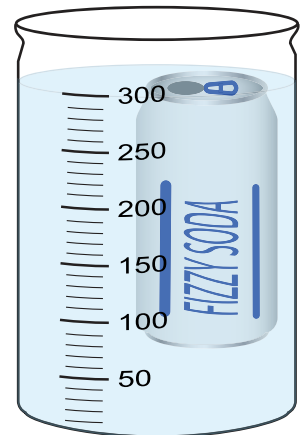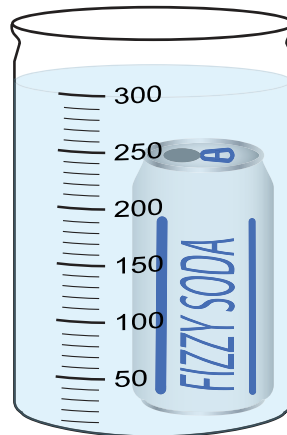
Questions

1. What happened?

_____

_____

2. Why do you think this happened? (Hint: look at the nutritional values on each of the cans of soda.)

_____

_____

3. Can you think of where you might have seen something like this happen before?

_____

_____

Nutrition Facts
Serv. Size 12 FL OZ (335 ML)
Amount Per Serving
Calories 140
% Daily Value*
0%
Total Fat 0g   2%
Sodium 50mg   13%
Total Carb 39g
  Sugars 39g
Protein 0g

*Percent Daily Values are based on a 2,000 calorie diet.

Carbonated water, high fructose corn syrup, caramel color, phosphoric acid, natural flavors, caffeine.

FIZZY SODA

Objects less dense than water float, and those denser than water sink.

The main difference between the two cans is the amount of sugar in the soda. The regular soda contains many sugar molecules. In fact, most regular cans of soda have about 39 grams of sugar. This makes the regular soda denser than water, causing it to sink. (Thirty-nine grams equal about 10 packets of sugar!)

Now let's check out the ingredients on the diet soda can.

The diet soda has aspartame in it. Aspartame is an artificial sweetener. Aspartame is concentrated, and only a small amount is needed to give something a sweet taste.

All things equal (including the can), there are many more molecules packed into the can of regular soda than the diet soda.

Nutrition Facts
Serv. Size 12 FL OZ (335 ML)
Amount Per Serving
Calories 0
% Daily Value*
0%
Total Fat 0g   2%
Sodium 40mg   0%
Total Carb 0g
Protein 0g

*Percent Daily Values are based on a 2,000 calorie diet.

Carbonated water, caramel color, aspapartame, phosphoric acid, natural flavors, caffeine.

FIZZY SODA
diet

education.com

Review Questions

1. Can two objects with the same volume have different masses?

_____

_____

2. What two things does density depend on?

_____

3. What do you think it means when an area is densely populated?

_____

_____

4. Fill in the definitions in the vocabulary box.

Vocabulary	
density	
mass	
volume	
atom	
molecule	

education.com

CELL PROJECT CHOICE BOARD

Choose <u>one</u> of the projects from the choices below to demonstrate your understanding of cell organelles and structures and their functions.

1. CELL CITY:	2. BUILD or BAKE a CELL:
- In Cell City, you will design a colorful city that represents a cell. You will compare the parts of the city to the organelles of a plant cell. - Decide what part of the city each organelle represents. - On a piece of poster paper, draw the layout of your city in color and with labels. Go over all your labels in pen. Come up with a creative city name. - Attach a piece of paper to your poster that explains why each part of the city represents a certain organelle. Here is an example of a explanation sentence: "The <u>city hall</u> represents the <u>nucleus</u> because it is the control center of the city. This is similar to a nucleus' job, which is to control a cell." - Keep in mind the part of the city's job should be similar to the job that the organelle does for the cell. An explanation of this should be included in your sentences.	- For this project, you will build or bake a model using whatever materials you want to represent all the organelles in a plant cell. - You must have an object or food item in your model represent every organelle in your cell. Pay attention to where they go in your model, what they look like, their size, etc. They should be representative of the real organelles in a cell. - Attach a piece of paper to your model explaining what item represents each organelle. Here is an example of an explanation sentence: "The large cookie in the middle of my dish represents the nucleus because it is a large organelle in the middle of the cell. The nucleus is the control center of the cell and also stores DNA (which are the sprinkles on my cookie)!" - To demonstrate your knowledge of what the organelles DO, include their **function** in your sentences.
3. WRITE A CELL RAP/ POEM/ or SONG:	4. CREATE A 30 QUESTION TEST ABOUT CELLS:
- Write a poem, rap, or song about a cell and all of its organelles. - Your poem, rap, or song should include information about all the cell organelles and structures and what they do in a cell. - You will turn your rap/poem/ or song in on a piece of paper and will have the option to either perform your piece at Office Hours for your teacher or in front of the entire class. - Your poem, rap, or song should rhyme!	- Write 30 test quality questions about cells, their organelles, and their structures. - You should have at least two questions about every organelle and structure. - Design a test that you and your 8th science classmates could take. - Your test should include different types of questions (at least 3 of the following): multiple choice, true false, fill in the blank, matching, short essay questions, etc.) - Your test should be free of spelling errors and be "ready" to give to students. - Turn in an answer key with your test.

EVERYONE'S PROJECT MUST INCLUDE THE FOLLOWING ORGANELLES or STRUCTURES:
      Nucleus
      Cytoplasm
      Cell membrane
      Ribosome
      Endoplasmic reticulum
      Golgi apparatus
      Vesicle
      Lysosome
      Mitochondria
      Vacuole
      Chloroplast
      Cell Wall

YOU MAY ALSO INCLUDE THE FOLLOWING IN YOUR PROJECT IF YOU WOULD LIKE:
      Nucleolus
      DNA

HOW CUP MATERIAL AFFECTS TEMPERATURE WARMING RATE OF LIQUIDS

BACKGROUND: Mmmmm….a nice cold cup of milk- **DELISCIOUS!** You start drinking your milk and then decide to have some cereal with it…but when you get back to your milk it's not as cold anymore. Cold liquids do not stay C O L D for long…but can you keep them colder longer? Does the type of material the cup the liquid is put into affect how quickly the water warms up to room temperature? Today you get to the bottom of this by measuring water warming rate in different material cups. Temperature will be recorded in each cup every 2 minutes.

PROBLEM: Does the type of material a cup is made of affect how quickly water warms in it?

HYPOTHESIS: *Use an IF and THEN statement* _____

_____

PROCEDURE:

1. Place a pitcher of COLD water in the refrigerator so all of it gets to the same cold temperature.
2. Decide what types of cups you will use for this experiment. List them in the Data Table.
3. Collect your materials: different types of cups, thermometers, data sheet
4. Measure the temperature of the water in the pitcher. This is your starting temperature.
5. Pour the exact same amount of C O L D water into each cup
6. Place a thermometer in each cup.
7. Without taking the thermometer out of the cups, record the temperature of each cup every 2 minutes.
8. Create a line graph of your data, using a different color line for each cup material
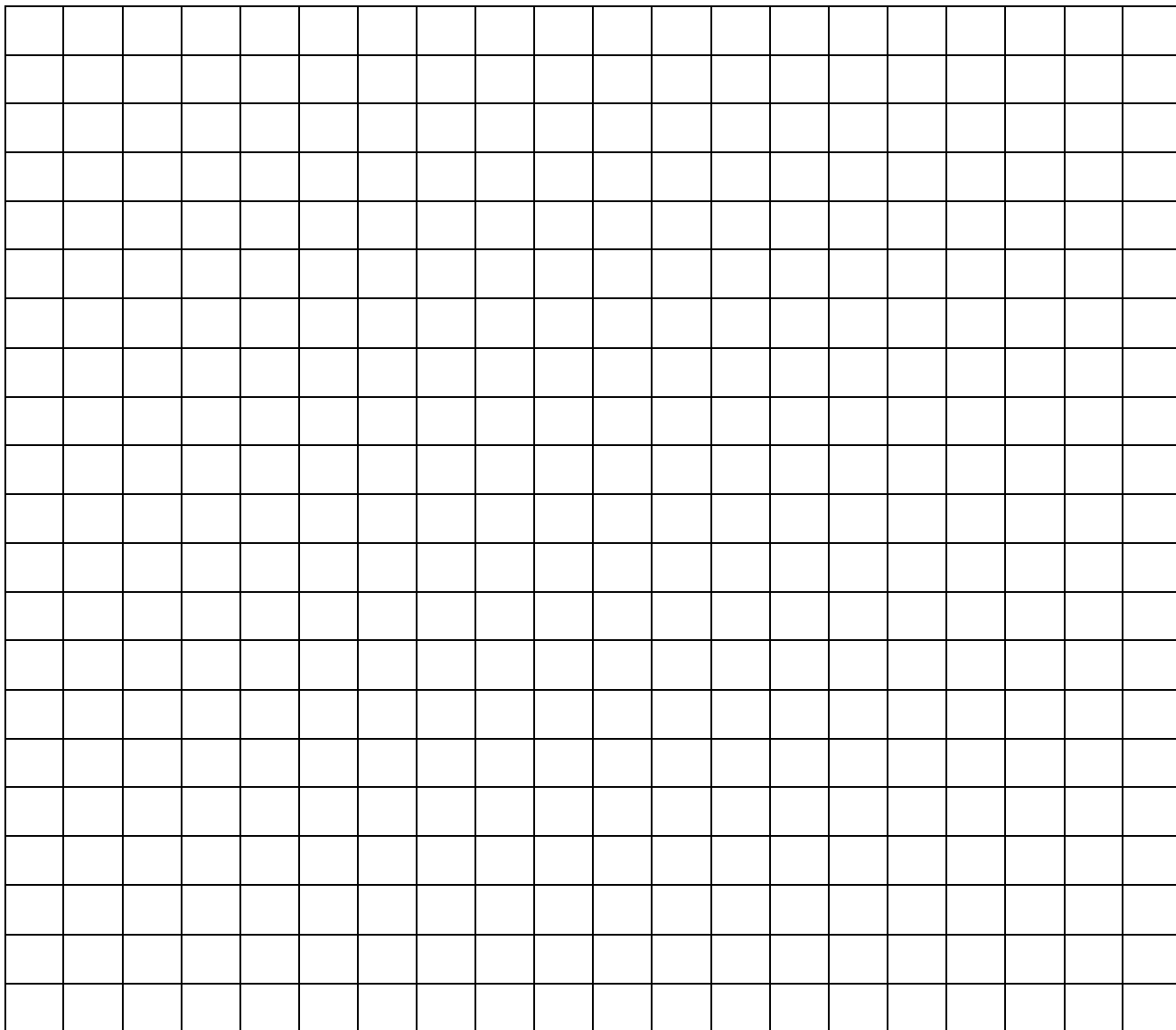
OBSERVATIONS:

DATA TABLE:

CUP MATERIAL	TEMPERATURE IN DEGREES FAHRENHEIT °F										
	0 min *(starting temperature)*	2 minutes	4 minutes	6 minutes	8 minutes	10 minutes	12 minutes	14 minutes	16 minutes	18 minutes	20 minutes

GRAPH YOUR RESULTS:

TITLE: _____

_____

○ = _____   ○ = _____
○ = _____   ○ = _____
○ = _____   ○ = _____

CONCLUSION: What did you learn (what cup material kept the water the coldest)? Was your

hypothesis proven? Why or why not? _____

_____

_____

_____

HOW CUP MATERIAL AFFECTS TEMPERATURE WARMING RATE OF LIQUIDS

BACKGROUND: Mmmmm….a nice cold cup of milk- **SO YUMMY!** You start drinking your milk and then decide to have some cereal with it…but when you get back to your milk it's not as cold anymore. Cold liquids do not stay C O L D for long…but can you keep them colder longer? Does the type of material the cup the liquid is put into affect how quickly the water warms up to room temperature? Today you get to the bottom of this by measuring water warming rate in different material cups. Temperature will be recorded in each cup every 2 minutes.

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4. Measure the temperature of the water in the pitcher. This is your starting temperature.
5. Pour the exact same amount of C O L D water into each cup
6. Place a thermometer in each cup.
7. Record the starting temperature of each cup in the data table.
8. Without taking the thermometer out of the cups, record the temperature of each cup every 2 minutes.

OBSERVATIONS:

DATA TABLE:

CUP MATERIAL	TEMPERATURE IN DEGREES FAHRENHEIT °F										
	0 min *(starting temperature)*	2 minutes	4 minutes	6 minutes	8 minutes	10 minutes	12 minutes	14 minutes	16 minutes	18 minutes	20 minutes

CONCLUSION: What did you learn (what cup material kept the water the coldest)? Was your

hypothesis proven? Why or why not? _____

_____

WEATHERING & EROSION

Weathering and erosion work together to change the environment. In nature, large things get broken down into smaller things over time. Boulders become sand and mountains become hills.
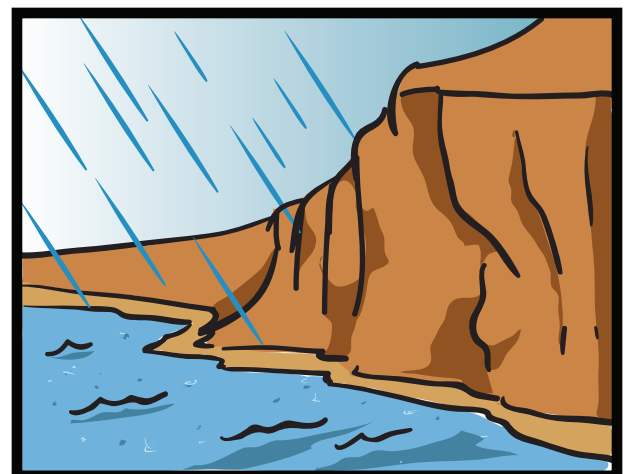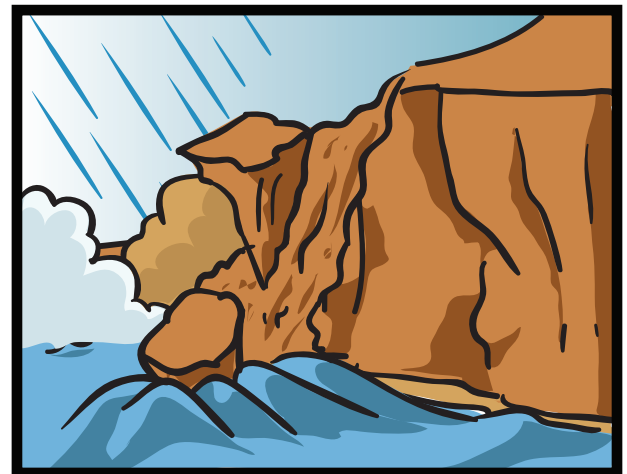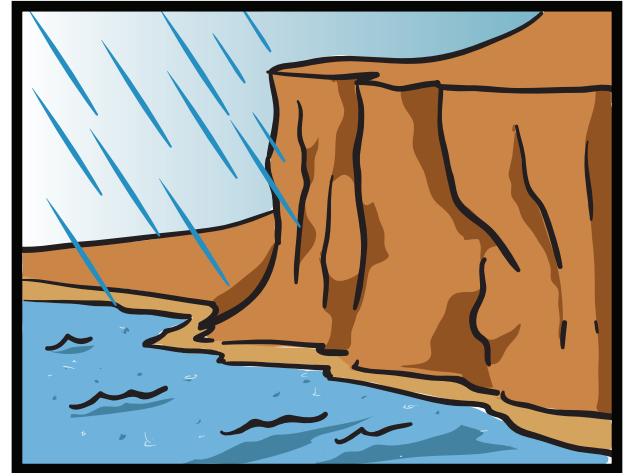
Weathering

Weathering is what breaks down rocks and boulders and turns them into tiny pieces called sediment. There is no movement in weathering. Weathering can happen for three different reasons: plants and animals, strong weather, or chemical changes in the earth or air.

Erosion

Erosion is what moves the soil and tiny rocks that weathering leaves behind. Erosion can happen because of gravity pulling soil downhill, or because of strong weather like rain or wind.

What is happening in this picture? Which part of the scene is "weathering" and which part is "erosion"? What caused the weathering and erosion in this picture?

More worksheets at www.education.com/worksheets

WEATHERING & EROSION

Weathering is what breaks down rocks and boulders and turns them into tiny pieces called *sediment*. There are three main types of weathering.

Types of Weathering

Physical Weathering / Mechanical Weathering is when nature plays a part in breaking down big rocks or mountains. There are no chemical changes in this type of weathering. Can you think of 3 types of weather that could break down rocks and soil into smaller parts?

_____

Chemical Weathering is when chemical reactions break down big rocks or mountains. One example of chemical weathering is acid rain, which happens when gases like nitrogen or sulfur are in the air.

_____

Biological Weathering / Organic Weathering is when living things break down big rocks or mountains. This type of weathering is usually a combination of chemical and physical weathering. Can you think of 3 living things that could break down rocks and soil into smaller parts?

_____

More worksheets at www.education.com/worksheets
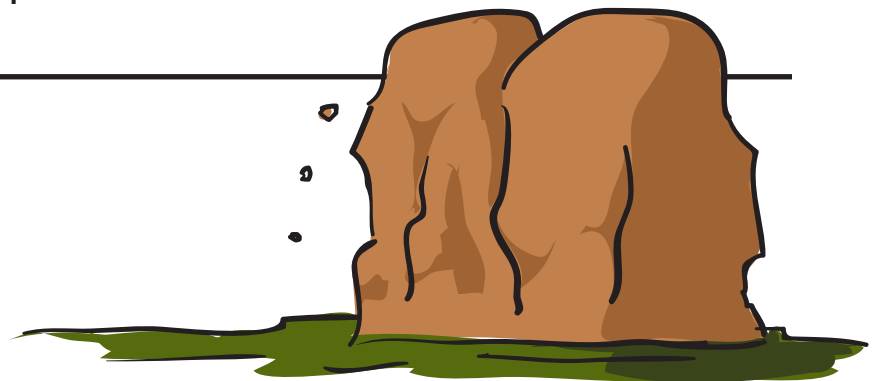
Demonstrating Water Erosion Of Land Masses

Water has power! It has the power to shape the surface of the Earth. Water can change one landform by washing away sediment and then depositing it somewhere else to create a new landform.

Problem:

How are new landforms created through erosion and deposition?

Materials:

- Dirt
- Small gravel
- Sand
- Deep baking dish or pan
- Book
- Pencil
- Paper cups

Procedure

1. Start by pouring sand, dirt, and gravel in layers at one end of the dish. This is your "landform." Use your hand to smooth the land. Leave the other end of the dish empty.
2. Dip your fingers into the water and slowly drip water over the land. Repeat this until the land is wet. What do you observe about the water that falls on the dry land? Record your observation
3. Slightly pick up on the end of the dish with the land in it. Place a book under that end.
4. Use a pencil tip to poke a tiny hole in the bottom of a paper cup. Hold the cup above the land. Slowly pour water into the cup and watch what happens to the land while the water drains onto it. Observe what is happening to both the land and the water.
5. Once the water has stopped draining, record your observations and include a drawing of your land's new form.
6. Add another book under the land end of the dish. Repeat the water draining activity. Observe what occurred with the land and water this time. Record your observations including a drawing.

The Eco Pyramid
by Michael Stahl
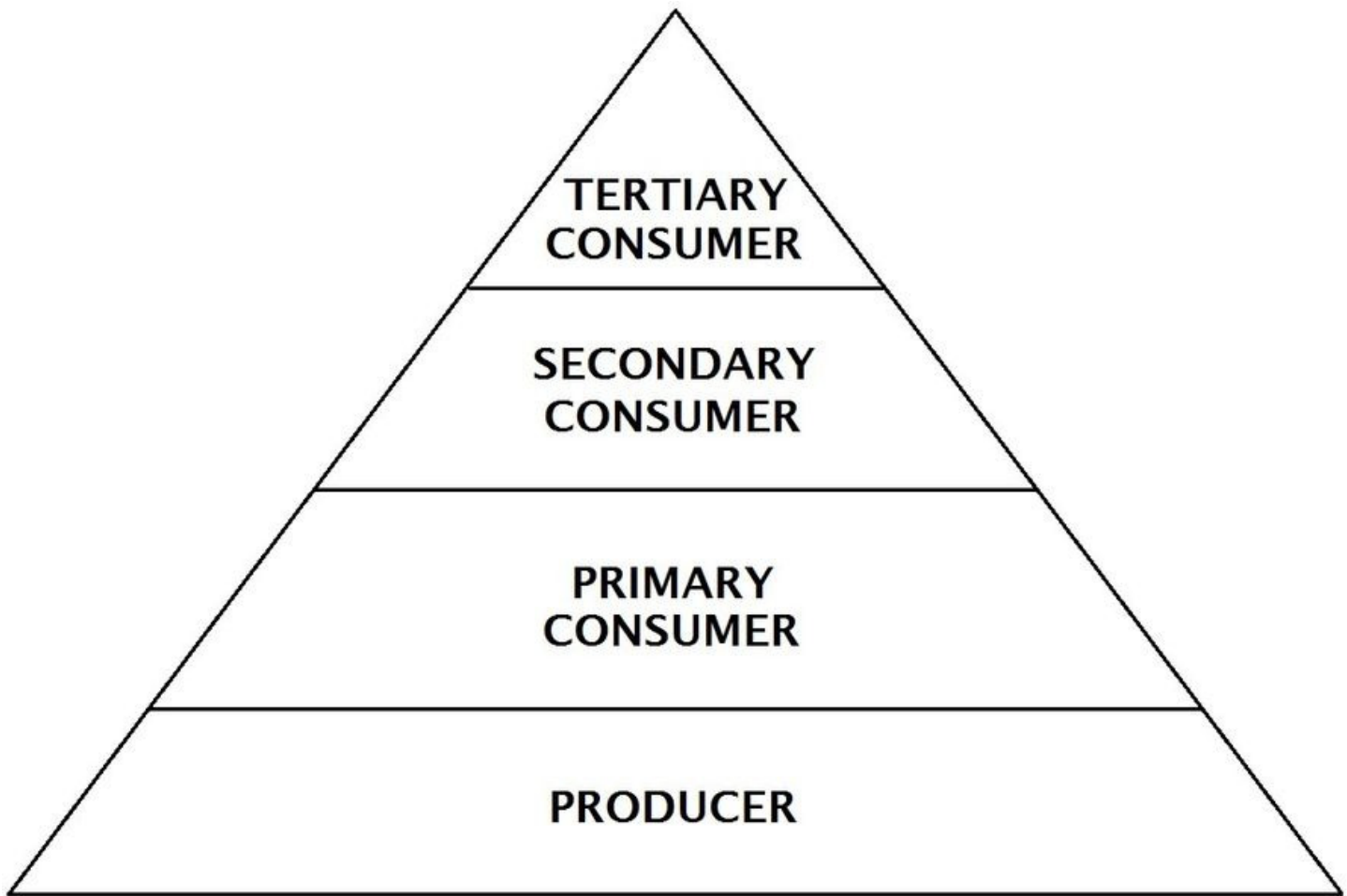
An ecosystem is a community of living organisms interacting with one another as well as with nonliving things. One very important aspect of an ecosystem is the energy that flows through it. Energy is exchanged between members of an ecosystem, creating an energy flow and assisting in the continuation of life. However, not all of the organisms living in an ecosystem absorb equal amounts of energy. An eco pyramid effectively illustrates the amounts of energy that are absorbed by the different types of organisms in an ecosystem.

The power of the earth's sun gets the energy flow of most ecosystems going. Solar rays enter the earth's atmosphere and reach the surface where plants utilize the energy from them. Through a process called photosynthesis, plants like trees, grass, and bushes, create food for themselves. Plants are able to take in carbon dioxide from the atmosphere, and their roots absorb water from the surrounding soil. Plants then use the solar energy and the hydrogen from water to transform the carbon dioxide into a nourishing carbohydrate. With photosynthesis complete and food and energy absorbed, the plants release the oxygen part of the water that they had taken from the soil back out into the atmosphere. Other living things, like human beings, take in oxygen in the breathing process. The plants of an ecosystem are called "autotrophs," which means "self-feeders." They are also called "producers" in an ecosystem.

The carbohydrates that were produced by the photosynthesis process give the plant energy to continue on living. Herbivores are animals that eat mostly, if not strictly, plant life. Termites, koalas, field mice, and deer are a few examples of herbivores. Deer feed on leaves and grass, consuming the green plant life's energy. To consume means to eat something and absorb its nutrients for survival. After eating the plants of their choice, deer will then digest the plants and use whatever nutrients the plant had stored inside to create energy so that they can continue to live. The herbivores of an ecosystem are called "primary consumers." Some of the energy that the herbivores use is lost in the ecosystem when they create body heat. For example, when deer run and their bodies warm up, the excess heat within their bodies escapes into the atmosphere. If that did not happen, the deer's bodies would get too hot and their organs would fail to work any longer.

Energy is transferred again in an ecosystem's energy flow from primary consumers to "secondary consumers." Carnivores, or meat eaters, act as secondary consumers. Lions, tigers, and polar bears are carnivorous. They eat the meat of the herbivores after a hunt. When tigers eat their prey's meat, they go on to digest it and use the energy from it for their own survival. Like the herbivores in the previous section of the energy flow, carnivores also give off heat energy when their bodies warm up from exercise. Unfortunately for the carnivorous secondary consumers, they too will eventually find themselves targeted for their energy by other members of their ecosystem: the tertiary consumers.

Secondary consumers are carnivorous predators, meaning that they hunt down other animals and kill them for food. However, these animals are not at the very top of the food chain and they too can be hunted and utilized as a meal. Tertiary consumers are predators who lie at the top of the food chain. Human beings are the most obvious example of a tertiary consumer. Unlike the secondary consumers, tertiary consumers are not normally preyed upon by other members of the ecosystem.

Like the primary and secondary consumers, the tertiary consumers give off body heat. That energy is released into the atmosphere. Even if consumers or producers aren't hunted or eaten, all living things eventually die. When they do, they decompose. Bacteria and fungi attach themselves to a dead producer or consumer and begin to break down the matter of the body, releasing nutrients into the soil. These nutrients are then used to give life to new plants so that new energy from the sun can flow through the eco pyramid.

Everyday Darwin: Create a Nature Journal

Charles Darwin is best known for discovering how species evolve and adapt, and your kid can follow in his footsteps. Take advantage of the sunny, warm weather and create a journal all about organisms in your community.

By creating an interactive observation notebook you will get a chance to see the world around her from a different point of view.

What You Need:

- Access to the library or Internet
- Notebook
- Pen
- Pencil

What You Do:

1. Do the Research.
    - Visit your local library or use the Internet to research several species that are indigenous to your area. Examples of search topics might be "California wildflowers" or "bird species of New England."
    - Choose at least two species—one plant and one animal—that you're fairly certain you can easily find in your area. In other words, try to stay away from reclusive animals or rare plants!
    - Use the first few pages of your notebook to record what you've learned, including drawings of the species, details on its habits, and information about where it can be found.
2. Create an Observation Chart.
    - In your notebook, set up a chart for observing your species in nature. Create one chart for each species you've chosen.
    - Create five columns, and label the first column of your chart with the heading "Date and Time." Label the remaining columns with these headings: "Location," "Weather Conditions," "Species Sighted?," and "Observations."
    - Make sure to leave extra room at the bottom for any additional notes.
3. Plan Your Observations.
    - Choose a few spots where you'll go to observe your species. Make sure that these spots are easily accessible, and that you'll be able to return to them at least a few times in the coming weeks.
    - Plan your observation schedule by deciding how often you'll visit your chosen spots, and over what time period your observations will take place. An ideal schedule might be to visit your spots once per week for three consecutive weeks, though visiting your spots daily over several days would also work fine.
4. Complete Your Observations.
    - Following your observation schedule, begin your research. Bring your notebook and visit each spot you've chosen. Make sure to fill in every column, recording as much detail as possible.
5. Compile Your Notes
    - Take the time to read your notes carefully, looking for general trends. When you review the results, note how your species' behave and how they seem to have adapted to their settings.