

TEACHERS
Serving
TEACHERS!®

Gro-Beast Alligator

GB-202, 210 and 220

What's a Gro-Beast?

Our Gro-Beast Alligator is made from a polymer that readily absorbs water. Materials of this type are said to be **hydrophilic** or water loving.

Materials with the opposite property are said to be **hydrophobic** or water fearing. An example of a hydrophobic substance is **Magic Sand (SS-2)**, which repels water and never seems to get “wet.”

When a small green alligator shape is placed in water, over the next few weeks, it increases in length, mass and volume.

When removed from water, the expanded alligator eventually returns to its original size.



NGSS Correlations

We are pleased to offer you these measuring and graphing activities for elementary school students. Our Gro-Beast Alligators and this lesson will support your students' understanding of this Next Generation Science Standard (NGSS):

Elementary

2-PS1-2

Students analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

Middle School

MS-PS1-2

Students can analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

MS/ETS1.B

A solution needs to be tested, and then modified on the basis of the test results in order to improve it.

High School

HS-PS2-6

Students will observe and communicate scientific information about why the molecular-level structure is important in the functioning of a material.

Suggested Science Idea(s)

2-PS1-2

Students can conduct simple tests using the Growing Alligators to better understand the rate at which the polymers absorb or evaporate water. Information gathered can be used as evidence to support or refute student ideas about hydrophilic (water-loving) materials.

MS-PS1-2

Students can analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

HS-PS2-6

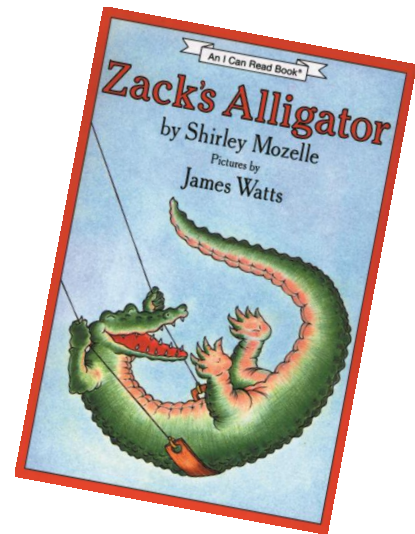
Students will observe and communicate scientific information about why the substance is able to absorb so much water. Further study of the structure of the hydrophilic polymers will help students to understand that the molecular-level structure is important in the functioning of a material.

** NGSS is a registered trademark of Achieve. Neither Achieve nor the lead states and partners that developed the Next Generation Science Standards were involved in the production of, and do not endorse, this product.*

Activity 1

The Growing Alligator

Introduce this activity by reading the story **Zack's Alligator** by Shirley Mozelle (BK-200). In this beautifully-illustrated book, all the fun begins for Zack (and your students!) when a small package arrives in the mail. Inside is a small alligator key chain and a note from Zack's uncle. Following his uncle's instructions, Zack places his key chain in the sink and—WOW!—a huge, fun-loving alligator emerges and continues to grow in size!



- 1.** Remove your Gro-Beast Alligator from its package and give students a chance to make observations about it. Explain that the alligator is going to change once you place it in water. The changes will take some time to occur.
- 2.** Hand out copies of the *Alligator Growth Record* worksheet on page 7. Encourage students to make predictions about the experiment and write them down on the worksheet. Ask them:
 - ✓ Can you estimate how long it is right now? How many centimeters?
 - ✓ Can you estimate its mass?
 - ✓ How big do you think it will get when it's placed in water?
 - ✓ How long will it get after one day? Three days? A week?
 - ✓ How heavy do you think it will get?
- 3.** When they're done with their estimates, take measurements of the alligator. An easy method for determining the length of its curved body is to use a string. Hold (or tape) one end of the string to the tip of its snout and begin laying the string along the body. When the tip of the tail is reached, cut the string. Then, measure the length of the string.

NOTE:
If you use the string method for determining the alligator's length, you may want to fasten each of the daily strings to a piece of paper to make a string bar graph. Try different colored strings each day!
- 4.** You will need a balance to determine the alligator's initial mass on Day 1 as well as its increased mass in the days that follow. (EI has **a full line of scales** available.) Once you've recorded the mass and length, place the alligator in a dishpan of water. Continue making measurements of its mass and length every day (preferably at about the same time of day) until the alligator reaches its maximum size.

The Growing Alligator

The notes and worksheets on these pages were shared by Karen Perkins, a third grade teacher in Greenwich, CT. The data she has provided was recorded by her students using a Gro-Beast. Because of varying conditions, you may or may not observe similar results.

As Prof. Henry Bent once said:

**Every experiment works!
But sometimes not the way you expect.**

Karen writes,

“I use this as a class lesson to teach prediction, measurement and record keeping. Different children are assigned to measure the length and determine the mass of the alligator each day. The Growing and Shrinking activities take us four weeks. Over this period, all students have a chance to take measurements and write them on our chart. I’m able to fairly assess each child’s measuring skills during this time.

*As a Literature Connection, we read **Zack’s Alligator** by Shirley Mozelle and **Lyle, Lyle Crocodile** by Bernard Waber. The children research the difference between alligators and crocodiles.*

As a Writing Connection, the children name our alligator and write stories about his adventures.

As a Math Connection, the children determine how much additional water the Gro-Beast has absorbed each day. This gives them practice in subtraction. As we gather data, the children construct bar graphs and line graphs.”

Actual Record of Alligator Growth

Day	Date	Length	Mass
1	Sept. 11	12½ cm	9 g
2	Sept. 12	24 cm	67 g
3	Sept. 13	29 cm	92 g
4	Sept. 14	32 cm	150 g
5	Sept. 15	33 cm	195 g
6	no school	-	-
7	no school	-	-
8	Sept. 18	35 cm	227 g
9	Sept. 19	36 ½ cm	230 g
10	Sept. 20	36 ½ cm	239 g
11	Sept. 21	37 cm	239 g
12	Sept. 22	37 cm	239 g

The Shrinking Alligator

Place the expanded alligator on paper towels or newspapers out of direct sunlight. Continue making measurements as the water slowly evaporates. Notice that the shrinkage of the alligator is a much slower process than its growth. Copy and distribute the *Alligator Shrinkage Record* worksheet (on page 8) so students can keep track of their measurements and other observations.

Actual Record of Alligator Shrinkage

Day	Date	Length	Mass
1	Sept. 24	37 cm	273 g
2	no school		
3	no school		
4	Sept. 27	34 cm	168 g
5	Sept. 28	30 ½ cm	136 g
6	Sept. 29	26 cm	107 g
7	Sept. 30	25 cm	82 g
8	Oct. 1	23 cm	67 g
9	no school		
10	no school		
11	Oct. 4	19 cm	32 g
12	Oct. 5	17 ½ cm	25 g
13	no school		
14	Oct. 7	15 cm	14 g
15	Oct. 8	14 cm	11 g
16	no school		
17	no school		
18	no school		
19	Oct. 12	14 cm	9 g
20	Oct. 13	14 cm	8 g



Activity 3

Alligator in a Bottle



An interesting activity for your science table is to expand a Gro-Beast Alligator inside a two-liter, clear, colorless, soda bottle. Simply place the Gro-Beast in water for about 15 minutes until the legs are softened enough to insert the alligator inside the empty bottle. Fill the bottle with water and tightly screw on the cap.

In about a week, the alligator will have filled the bottle as can be seen in the photo below. Actually, the alligator continues to absorb water over the next few months as can be seen by a gradual change in the curl of its tail.

A few pointers:

In some parts of the country, distilled water may increase the size of your Gro-Beast Alligator.

*Please keep your Gro-Beast Alligator out of direct sunlight!
Over time, UV radiation will degrade the polymer.*

Activity 4

Further Experimentation

Your Gro-Beast Alligator can be used for many other science projects. For example, your students can investigate the effect of the growth of Gro-Beast Alligators by using:

- ✓ Different water sources: pond water, salt water, bottled water, distilled water, etc.
- ✓ Different concentrations of various dissolved substances, such as sugar, baking soda, or salt.
- ✓ Different solutions with varying pH, such as different concentrations of vinegar, baking soda, etc.
- ✓ Different temperatures.
- ✓ Different exposures to direct sunlight.
- ✓ Different carbonated beverages, sugar vs. sugar free soda, etc.



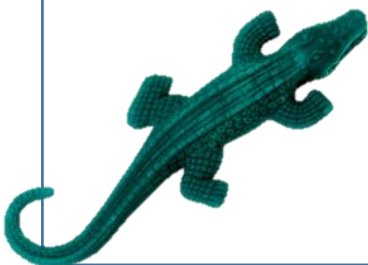
Name: _____

Alligator Growth Record



Day	Date	Length	Mass	Observation Notes
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

General Notes:



Name: _____



Alligator Shrinkage Record

Day	Date	Length	Mass	Observation Notes
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

General Notes:



Name: _____

Our Alligator

You can draw
a picture of
your alligator
on the back
of this page!

Today, we met our class alligator.

I estimate that the length from the tip of its nose to the tip of its tail is _____ cm.

I estimate that it weighs _____ grams.

When we measured our alligator, it was _____ cm long.

When we weighed our alligator, it was _____ grams.

We predict that our alligator is going to grow when we place it in a tub of water.

I estimate that when it is fully grown, it will be _____ cm long and it will weigh _____ grams.

I predict that it will take _____ days to reach its full size.

The date will be _____ .

RESULTS:

Our alligator reached its full size on: _____

It took _____ days.



Take Your Lesson Further

As science teachers ourselves, we know how much effort goes into preparing lessons. For us, “*Teachers Serving Teachers*” isn’t just a slogan—it’s our promise to you!

Please visit our website
for more lesson ideas:

www.TeacherSource.com

Check our blog for classroom-tested
teaching plans on dozens of topics:

<http://blog.TeacherSource.com>

Educational Innovations has many hydrophilic materials that can be used in follow-up lessons. Consider our other “Gro-Beasts” shaped of like frogs and dinosaurs. These critters start at 1-3" long and expand by up to 600% when left in water. They are fantastic for any grade level, and affordable enough to hand out to every student in your class.



Hydrophilic Growing Spheres, Cubes, Spikes and Crystals are also excellent for investigating concepts like mass, volume, surface area, absorption and more.

Gro-Beast Dinosaur (GB-1)

Growing Spheres (GB-702, GB-710, GB-730)

Growing Cubes (GB-740)

Water Gel Crystals (GB-5C)

Growing Frogs (GB-25)

Water Gel Spikes (GB-3)



And don't forget our **HYDROPHOBIC** material!

Magic Sand (MS-2)



Magic Sand is regular sand which has been dyed and coated with a hydrophobic material—a substance which repels water. The coating on the outside of the magic sand repels water and keeps the sand dry, even when submerged in water! Available in four fluorescent colors.