

INVESTIGATING A MAGIC EGG/GROW CREATURE

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The purpose of this experiment is to investigate a Magic Egg, also called by a number of other names such as Water Wonder Creature, Grow Creature or Grow Beast. A Magic Egg was originally named for the plastic egg that contained the small plastic creature that swells up many times its original size when placed in water. The original creature is composed of a plastic called a graft copolymer of hydrolyzed starch-polyacrylonitrile (polyacrylonitrile is commonly known as "Acrilan", "Orlon", or "Creslan"). Such materials are called superabsorbants or "super slurpers" and some are capable of absorbing up to 2000 times their weight in distilled water. By combining the starch-polyacrylonitrile with glycerin or ethylene glycol (the active ingredient in anti-freeze), a strong and resilient plastic gel is produced that can absorb up to 400 times its weight in -distilled water.

CAUTION: The Magic Egg/Grow Creatures are safe and harmless, but they are not edible and should not be placed in the mouth. Wash your hands after handling the creature to prevent accidental transfer of the plastic to food or your mouth.

Measuring the Growth of a Grow Creature

Materials needed

- a grow creature
- water (distilled water preferred but not required - available in supermarkets, drug stores, or auto stores)
- quart jar or bowl (plastic preferred)
- ruler
- balance or scale (optional) - a postage scale can be used

Procedure

1. Examine the grow creature.
 - a) What is the creature shaped like? _____
 - b) Using a ruler, measure the creature (use millimeters [mm] or centimeters [cm] but be sure to indicate the proper units with your measurement).
 - How long is the creature? _____
 - How wide is the creature? _____
 - How thick is the creature? _____
 - c) If you have a small scale, such as a postage scale, weigh the creature. (be sure to tell the units of weight used)
 - How much does the creature weigh? _____
2. Put the creature in a clean container, such as a water glass, a jar, a glass or plastic bowl or a round 8-inch or 9-inch cake pan. Fill the container with enough water to cover the creature. Tell the current date and time.

Date _____ Time _____

3. Check the creature at the time intervals indicated below. Describe how it has changed.

a. Changes after 1 hour:

How long is the creature at this time? _____

b. Changes after another hour (2 hours total time):

How long is the creature at this time? _____

c. Changes at the end of 4 hours:

How long is the creature at this time? _____

4. Check the creature after about 8 to 12 hours (in the morning, if left growing overnight). Describe any changes.

How long is the creature at this time? _____

Tell the Date _____ and Time _____

5. Check the creature after about 24 hours. Describe any changes.

How long is the creature? _____

How wide is the creature? _____

How thick is the creature? _____

How much does the creature weigh? _____

Tell the Date _____ and Time _____

6. If desired, the creature can be allowed to grow for a longer period of time. Check the creature at 24 hour intervals until growing stops.

7. Remove the creature from the water. Let it dry out by putting it on a dry dish or in a dry pan.

a) How long does it take for the creature to dry out? _____

b) Did the creature shrink down to its original size? (you might want to measure and weigh the creature)

8. Place the creature back in water.

a) How long does it take the creature to become full grown? _____

b) Does your experiment indicate that the creature can be grown and dried out over and over without the creature falling apart?

9. *Optional:* Construct a graph to show the rate of growth of the grow creature. Construct a graph to show the rate of shrinking of the grow creature. Compare the two graphs.

Effects of Dissolved Solids on Growth of a Grow Creature

Materials needed:

6 grow creatures (try to get 6 of the same creature)

distilled water (available in the supermarket or an auto supply store)

tap water

Prepare solutions of table salt (sodium chloride, NaCl) in water:

0.5% salt: dissolve 2.5 g salt in 500 mL of water (1/2 teaspoon salt in 3 cups water)

1% salt: dissolve 5.0 g salt in 500 mL of water (1 teaspoon salt in 3 cups water)

2% salt: dissolve 10.0 g salt in 500 mL of water (2 teaspoons salt in 3 cups water)

plastic containers or wide mouth glass jars - 500 mL to 1 L capacity (1 quart)

Procedure:

Measure the length, width and thickness of the grow creatures. Record your measurements. (If balances are available, weight the creatures.)

Place distilled water, tap water, and the salt solutions in five separate jars or -containers. Place one grow creature in each solution and allow them to sit, undisturbed overnight (about 24 hours, or longer if preferred). Keep one grow creature as a control.

Remove the grow creatures and inspect them. Did they all grow?

Measure the grow creatures (or compare them to the control). How much did they grow?

What are the effects of dissolved materials in the water on the growth of a grow -creature?
(If desired you can graph the results using length or weight/mass)

Effect of Salt on a Grow Creature

Materials needed

a grow creature
water (distilled water preferred)
salt (sodium chloride, NaCl)
jar or container for growing the grow creature
bowl (plastic preferred)

Procedure

Grow the grow creature in water for at least 24 hours.

Remove the grow creature from the water and place it in a bowl.

Sprinkle salt over the grow creature. Observe the grow creature. What is happening?

(Note: After the experiment, the grow creature can be rinsed off and reused.)