

Magna-Bugs

MATERIALS

FOR STUDENT:
(one per student unless otherwise noted)

- FloraCraft® Make It: Fun® Foam Ball, 1 1/2" diameter
- Magnets, 3/4" diameter x 1/8" thick button type, two
- Colored wire, 22 gauge, two 7" lengths, choice of color: Purple, pink, yellow, green or blue
- Colored brads (paper fasteners), (quantity assigned by teacher), choice of color: Purple, pink, yellow, green or blue
- Circle sticker labels, 3/4" diameter, two per student
- Paper plate
- Small plastic cup (to hold parts)

FOR TEACHER:

- FloraCraft® Design It:® Wire Cutter
- Pencil
- White paint marker with small tip
- Ruler
- Serrated knife
- Scissors
- Glue gun (for teacher only)



MATH

GRADE LEVEL
KINDERGARTEN – FIRST

COMPLETION TIME

- 30 minutes



OBJECTIVES

Students learn:

- To count from 1- 10 and potentially up to 20
- The concept of grouping to count and begin adding and subtracting
- To listen and follow step-by-step instructions
- The use of fine motor skills

STANDARDS

- Counting and cardinality – comparing numbers
- Identify greater than, less than, or equal to the number of objects in another group by using math and counting strategies
- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from
- Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions or equations

TEACHER PREPARATION

Note: Read through all the instructions first and check out the TIPS! Have a glue gun plugged in and ready to use (ideally set on low temperature) but out of student reach. This can give you immediate adhesion when you're in a hurry to help the students. It is also recommended that you make one pair of bugs first, before preparing the materials for any others, since knowing how the parts fit, might affect how you prepare.

[1] Use a serrated knife to cut in half the foam balls, cutting them as evenly as possible. Over a plastic-lined wastebasket, rub together the cut sides to smooth. Also, trim off 1/4 along the edge of each one to create a gluing area for the magnet.

Gently press and roll each foam ball half along its edge on the table, to smooth and round slightly.

[2] Use the ruler and a wire cutter to measure and cut same-color wire to two 7" lengths per student.

[3] Check the polarity on a pair of magnets. (See TIPS). Use a white paint marker to make three dots for the eyes and a nose on each magnet. Let them completely dry.

To attach the magnet, set a foam ball half in front of you with the large flat side down. Use the glue gun to apply a generous amount of glue to the lower half of the back of the magnet and press it against the flat front of the foam ball half. Repeat, making two for each student.

[4] For each student, cut from the backing sheet of the circle stickers, two circles. Use a marker to write the student's name on the two circles. For each student, set on a paper plate: Two matching bugs, two same-color wires and a cup with the number of brads you want that student to have. (Give students 2, 4, 6, 8 or 10 brads so that when they play together, adding bug spots, they can have different numbers.)

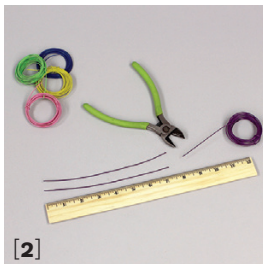
LESSON INTRODUCTION

Show the students how magnets work by attraction. Explain that they can make magnetic bugs that have spots on their backs. They will be able to count the spots on one bug, have it attract another bug and then figure the number of total spots they have on both bugs.

- Give them examples, explaining that when they combine spots, they are "adding" and when they remove spots, they are subtracting.



[1]



[2]



[3]



[4]



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INSTRUCTIONS

[1] Explain to the students that they will be making two bugs and that you have already painted the features and glued on the heads. Show how they are attracted to each other, because of the magnets. Ask them to be gentle with the bugs so their heads don't come off. Also, explain that they should leave their brads in the cups until it's time to put them on their bugs.

Demonstrate and ask students to wrap one wire around the neck of one bug, with the ends going straight up like an upper case "U". Explain that these are the bug antennae. Then show them how to cross the wires like an "X". Repeat with the other bug.



[2] Demonstrate and have the students gently twist the wire close to the neck. Check the bugs to be sure that the twist is correct on each. Then have them repeat the process with their other bug.

Next, demonstrate and have them pinch the end of one wire and twist their hand to curl the wire a little. Show them how to pinch again to keep the curl going into a spiral.



[3] After you've approved how they have curled one antenna on one bug, have them repeat the process with the remaining antennae.



[4] Show the students how to take one brad of each color from the cup and set it (or them, depending on the number they've been given) on the plate. They should plan how that number of brads should be placed in the back of one bug for its spots. Then have them repeat for the other bug.



[5] Demonstrate and have the students turn over their bugs and attach their name stickers to the bottom of each.



[6] If time, let the students add and subtract spots on their bugs, working together to create addition problems of their own.

MODIFICATIONS

To simplify project:

- Have antennae already attached or eliminate the antennae.
- Have the students each make only one bug and find their match (same color and number of spots) among the students.

To expand project:

- Have the students design other types of bugs (with or without magnets) using different size foam balls for bodies, chenille stem or wire for legs, cardstock paper for wings, and beads and other craft basics for wherever their imagination takes them. (Use toothpicks to connect foam balls.)
- Use larger foam balls and increase the number of spots so they can add and subtract larger numbers.

For multiple ages:

- Younger and older students can work side-by-side, with the older students designing different bugs while the younger students work on this one.
- Have older students use bugs to start multiplying and dividing the brad spots.

ADDITIONAL IDEAS

- Research the science of magnets to learn more about polarity.
- Make giant bugs with large 3" – 7" diameter foam balls and increase the size of the magnets (or use groups of magnets). Use jumbo brads (available on-line) for spots or come up with alternatives like buttons.
- Use circle stickers to put numbers (same as the number of spots) on the bottoms of the bugs so that students can self-check.
- Create other foam animals that have spots.
- If the bugs become worn and the brads slip out too easily, use a glue gun to permanently glue them in and have students use the bugs as units, such as counting by twos, fours, sixes, etc.



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TIPS

- If any cut edges of the foam are irregular, gently rub another cut edge of foam against it, over a plastic-lined wastebasket, to sand them down and smooth them.
- Magnets are polarized, so be sure that you put two magnets together, then separate them and draw faces on the sides that attracted. Later, glue the opposite sides to the foam ball halves. If you don't check the polarity, the bugs will repel each other.
- When gluing magnets, keep the foam ball body flat on the table so that the "chin" of the magnet is even with the bottom of the body, or the bugs won't be flat on the table. Work on a plastic bag to catch glue drips, since plastic allows you to peel them away, if you do shortly after gluing.
- If the magnet heads break off from rough play, they will probably snap part of the foam, too. Use the glue gun to re-glue, connecting the pieces immediately after applying the glue.
- Have students keep their bugs in their cups, or give them plastic zip-sealed bags to hold everything.

REFERENCES

The Grouchy Ladybug by Eric Carle
One Hundred Is A Family by Pam MuNoz Ryan
How Many Feet In Bed? by Diane Johnston Hamm
Edgar Allan Poe's Pie: Math Puzzlers in Classic Poems by J. Patrick Lewis