



Don't Forget!

Activity 2: Grades 5-8

Puzzle Solving

Memory, like most brain abilities, seems to suffer fewer ravages of aging in individuals who keep mentally active. Scientists believe this may be due to the continued reinforcement of the brain cell pathways along which thoughts travel. As you think, messages move along the living network of brain cells. When a brain cell is stimulated, it releases chemicals called neurotransmitters. Some neurotransmitters carry messages to neighboring cells. Others maintain the health and longevity of the inter-cellular connections. Still others encourage the growth of new cell connections to produce even more robust pathways. So by using an assortment of thinking pathways, you can sustain and even improve the fitness of your network of brain cells.

This activity page will offer:

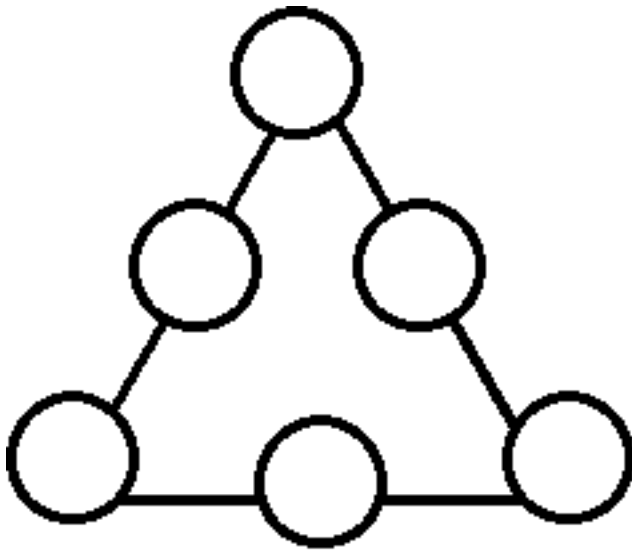
- A minds-on and hands-on experience in puzzle solving
- An opportunity to apply and sharpen critical thinking skills
- An arena to think out of the box
- An opportunity to create a puzzling challenge

Puzzle Solving

Recent research suggests that puzzle solving may be more than just a pleasant hobby or pastime. It may have a therapeutic role in preventing or at last delaying senility. Puzzles often require novel or creative approaches to examining situations. This engages a robust series of brain cell connections. Here is an assortment of puzzles that should not only entertain and challenge you, but also stimulate the growth and health of your brain cell.

Magic Triangle

Check out the triangle presented here. Although it has no mystic powers, it's called a magic triangle. The magic lies in your mathematical insight. Using the digits 1 through 6, fill in the empty circles. Place a different digit in each circle so that the sum (three circle values added) of any is equal to the sum of any other side. In other words, all three sides will have the same sum when their circle values are added together.

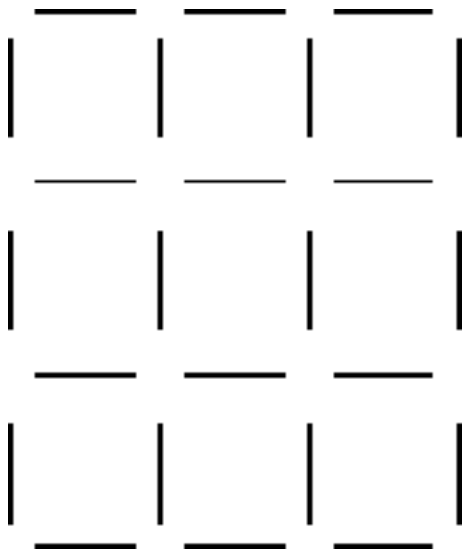


Pizza By the Slice

Imagine a large round pizza that has just come out of the oven. Using only three cuts, how can you divide this pie into eight equal pieces? HINT: Don't worry about the mess!

Toothpick Tricks

Position toothpicks in the pattern shown here. Remove six toothpicks and leave only three complete squares behind. HINT: the squares can be of any size.



More Toothpicks

These six toothpicks are arranged to form two equal-sized triangles. Reposition these toothpicks to form four triangles that are the same size as these two original triangles. HINT: Think outside of the box (and outside of the plane).



Measuring Mania

Suppose you need to measure 1 cup of water. You have only two containers. The smaller container holds 3 cups. The larger container holds 5 cups. What strategy can you use to measure out exactly 1 cup of water using these two containers?

Moldy Math

A bread mold grows on a slice of bread that has an exposed surface of 10 cm by 10 cm. The mold grows only upon this exposed surface and doubles in size every day. On day 28, the colony has expanded to cover the entire exposed surface of the bread. On what day was half the surface covered?

Make Your Own Puzzle

Do you think you can create your own puzzle? It may not be as difficult as you think. Consider the parts of a puzzle. How does the "trick" fit into the strategy for solving a puzzle? Take another look at the previous puzzles. What tricks, novel solutions, or "exceptions to the rules" might be applicable to the creation of a new puzzle? Create a new puzzle scenario and share it with classmates.

Web Connection

[Brain Teasers for Education and Fun](http://7-12educators.about.com/blbrainteasers.htm)

<http://7-12educators.about.com/blbrainteasers.htm>

An assortment of grade 7-12 brainteasers, riddles, and lateral thinking puzzles.

[Jigsaw Puzzles Online](http://www.jigzone.com/)

<http://www.jigzone.com/>

An assortment of online jigsaw puzzles.

[Puzzles Online](http://puzzles.about.com/gi/dynamic/offsite.htm?site=http://www.puzz.com/index.html)

[http://puzzles.about.com/gi/dynamic/](http://puzzles.about.com/gi/dynamic/offsite.htm?site=http://www.puzz.com/index.html)

[offsite.htm?site=http://www.puzz.com/index.html](http://puzzles.about.com/gi/dynamic/offsite.htm?site=http://www.puzz.com/index.html)

A free online puzzle book with all sorts of puzzles and math thinking skill challenges.



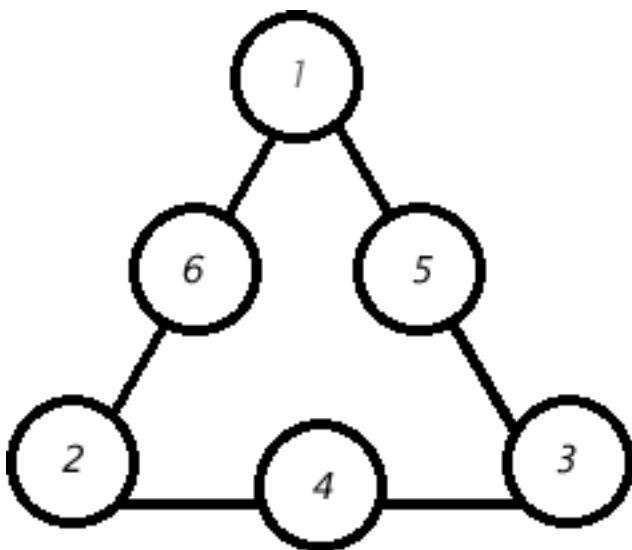
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Magic Triangle Answer

There are several combinations that will work. Here's one that works using the side sum of nine.



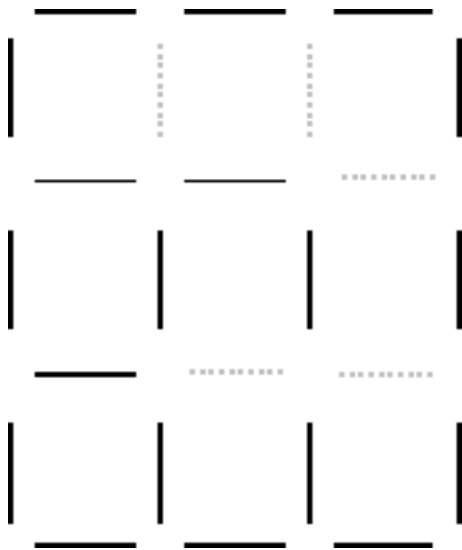
Pizza By the Slice

Imagine a large round pizza that has just come out of the oven. Using only three cuts, how can you divide this pie into eight equal pieces? HINT: Don't worry about the mess!

Use your knife to cut the circular pie in half along its diameter. Then, stack one half on top of the other. Divide the half circles with a single cut through two layers. Now, stack all four wedge-shaped sections together. A single cut through the middle of the stack creates eight, equal-sized slices.

Toothpick Tricks Answer

Position toothpicks in the pattern shown here. Remove six toothpicks and leave only three complete squares behind. HINT: the squares can be of any size.



More Toothpicks Answer

You need to construct a 3D pyramid structure with one of the original triangles becoming the pyramid's base. The remaining three toothpicks form the edges of the three vertical sides that rise up from the desktop.

Measuring Mania Answer

Fill the 3-cup container with water. Pour this water into the 5-cup container. Again fill the 3-cup container with water. Pour this water into the 5-cup until it fills with water. The water volume that remains in the 3-cup container is equal to exactly one cup.

Moldy Math Answer

Day 27. Since it doubles size every day, on the day prior to covering the whole surface, the mold encrusted half the surface.