

# Mad Science



# Use as a Rally, sleepover or day camp



## Planning the Day

**When:** Whenever you decide works best for your group. Use the kit as a day camp, rally or a sleepover.

**Time:** This package is set up like a 2 hour event in a round robin style. You can adjust as needed.

**Theme:** ***Mad Science***

**Who:** Guides!!!

- The number of participants for your event should be based on what is comfortable and sensible for your Guides and you.
- You can do this as a unit or get together with another unit. You may even consider having a bridging event.
- You could have the Guides invite their families or maybe have them bring a friend.
- You will need to make sure ratio is covered and that you have enough adults to work each round robin station.

**Where:** That depends on you. Have it outdoors or in. Make sure your location is large enough to have the space to have all the activities and accommodate the number of people you have invited.

## Health and Safety

- Be sure to use Safe Guide in planning the event. Be sure to fill out all appropriate forms and make sure they are sent in early enough to have time to be assessed.
- Once you have all the details be sure to send a note home including a permission slip.
- Keep all your permission forms and health forms with you at the event in the first aid kit where they are secure and accessible during the day.

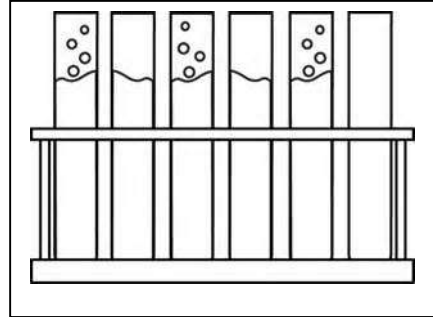
**Cost:** depending on your Unit finances, you may need to charge each Guide a nominal fee to defray the day's expenses.

## Activity Planning

If the number of Guides you have coming is less than 12 you may choose to do activities all together in consecutive order as opposed to a round robin.

*Here is a suggested outline for a smaller event*

- 10 min Opening/ gathering activity
- 20 min activity
- 20 min activity
- 20 min snack
- 20 min activity
- 20 min activity
- 10 min closing

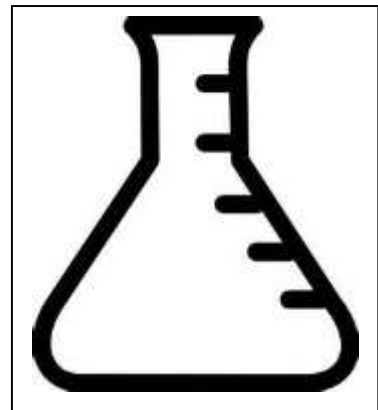


If the number of Guides you have is larger more around 20-50 you will want to use this round robin format. This is where a small group of girls and adults move from one activity station to another.

*Here is a suggested outline for a larger event*

- 10 min Opening/ gathering activity (name tags and group designation)
- 20 min round robin activity 1
- 20 min round robin activity 2
- 20 min round robin activity 3
- 20 min round robin activity 4
- 20 min round robin activity 5
- 10 min closing- everyone together

One of the round robin station will be a snack station in this format.



## Opening Activities

You can use the shapes for name tags provided in this package or create your own. Name tags are an easy way for everyone to see where they belong and needed when everyone doesn't know each other.

Have everyone gather in a circle. Welcome everyone to the event explain the days activities. If there is time sing a fun action song or two.

## **Suggested activities for Group or Round Robin Sessions**

### **Active Games**

#### Amoeba

**You'll need:** a small stuffed animal or a rubber chicken or a soft ball

**What to do:**

Have all players hold hands and form a circle. Place your object in the middle of the circle. The object of the game is to try and get other people to touch the object in the middle. This can be done by pulling, pushing and manipulating the circle, but everyone must continue to hold hands. If you touch the object you are eliminated.

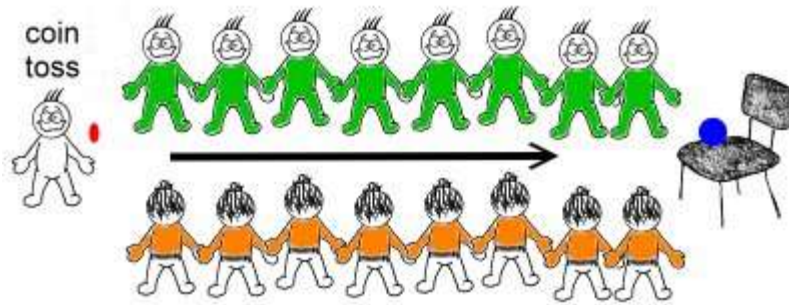
Once eliminated you could start another amoeba where the players who get eliminated can join. You can't get eliminated from the second amoeba.

#### Electric Current Game

**You'll need:** a coin, a chair and a small object (eg, keys, small stuffed toy)

**What to do:**

You split up the group into 2 teams of equal size. Set the teams up like this.



Have one Guider stand at the coin toss end and have the object at the other end on a chair. Have everyone hold hands in their line and close their eyes except for the first person on each team in front of the coin toss. For each round the Guider is going to flip the coin quietly so only the first two players at the front of the row can see. Whenever the coin shows “heads” the two people at the front of the line squeeze the hand of the person next to them as quickly as possible. Whenever any player gets their hand squeezed they pass it down the line till it reaches the last player. The last player then opens their eyes and then grabs the object. The first team to grab the object gets a point. After each round the team shuffles down a spot and the first players move to the grabbing spot. Play until everyone has had a turn in each spot. Team with the most points wins.

## Static Circles

**You’ll need:** Tissue paper in different colors, balloons

### **What to do:**

Split the girls into equal teams of about three or four players. You will cut out circles of tissue paper. One colour circle will be assigned per team. You will need about 15 circles per team.

Now scatter all the circles around the middle of the room. Each player will be given a balloon. On go all the kids will rub their balloons on their heads and start to pick up their colour circles using only their balloon which is now charged with static electricity.

Have the girls gather their teams colour in a specific location. The first team to collect all the circles wins.

## Racing Pom Poms

**You’ll need:** painters masking tape, straws, pom pom balls

### **What to do:**

Before the game starts tape down a track on the floor, one per team. Now split the girls up into teams and give everyone a straw. On “go” the girls at the front of each team will blow their pom pom on the track, to the end. Once at the end they will pick it up and run back to the next player. First team finished wins.

You can have individual races as well. The tracks you make should not just be straight to add difficulty.

## Elements

**You'll need:** Hat, bean bag or Frisbee

**What to do:**

Have all the girls form a circle.

Select a person to go into the middle. The person in the middle call out of four words, EARTH, WATER, AIR or FIRE. The person in the middle throws the bean bag to someone in the circle. The person catching the bean bag must name something living in the element called out e.g. Earth- bear; Water- shark; Air- pigeon. If FIRE is called out the person catching it says nothing and returns it as soon as possible. You have 10 seconds to give an answer, and no repeats! If you can't answer, you go in the middle.

Variations: Select a continent before the game starts; all answers must come from that continent. Or, go through the alphabet for living nature names.

From: <http://dragon.sleepdeprived.ca/games/ecological/ecology.htm>

## Quiet Activities

### Tangrams

Tangrams are ancient Chinese Puzzles, made up of seven movable geometrical shapes, with which you can create thousands of pictures and designs. The purpose of this puzzle is to use all seven pieces or tans to *create a picture or design*. The ancient rules dictate that the pieces must

lie flat, they must touch and they are not allowed to overlap.

Another fun activity is to *solve puzzles* - this means you take a tangram picture/image and figure out how the shapes were placed to create that image - sounds easier than it is.

**You'll need:** The tangrams puzzle the end of this package, cardstock, scissors, fun foam

**What to do:**

1. Print off the puzzle pages as well as the solutions
2. Have the girls glue their puzzle onto cardstock and then cut out the pieces or use it as a template and cut the pieces out of fun foam.
3. Then using their puzzle pieces have them try to make as many of the puzzles as possible. There is a solution page as well if needed.

## Egg Drop

**You'll need:** a drop cloth/ table cloth, raw eggs, straws, masking tape, newspaper

**What to do:**

Split the girls into teams of 4 or 5 girls. Give each team materials for building( 5-12 straws, a roll of tape, a raw egg and newspaper). Tell the teams they have a set time limit (whatever you feel is fair depending on your group) to build a structure with the egg inside. When time is up gather everyone in a group and start dropping the structures from about 10 feet and see which teams egg survived the fall.

There are many variations of this activity. You may give the girls play money and make them buy the materials. This would mean the team that spent the less money but with the intact egg wins. If you were outside they might have to use natural materials they find.

## Science

### Skewered Balloons!

**What You Need:** Several thin bamboo barbecue skewers, Small dish of vegetable oil, Large latex balloon

**What To Do:**

1. Blow up your latex balloon to a point just short of being full--so that it's still a little squishy—and so there is a dark area at each end. Knot it off.
2. Now take a bamboo barbecue skewer and dip the sharp point into the vegetable oil so that the top 1" or so is well soaked.
3. Using a twisting motion as you go, poke the sharp into the dark , thicker latex near where you tied the balloon off. Drive the skewer all the way through to the dark latex on the far side. Still twisting, push the skewer through the far side of the balloon.
4. Anyone who is watching will expect it to pop! The balloon will hold its air, because the polymers in the latex haven't been stretched to their fullest point. They can still stretch and surround the barbecue skewer. In fact, you can keep going. See how many skewers you can drive through the balloon. As long as you leave them inside, the balloon will hold most of its air. After a while, of course, air will leak out.

## Can Crusher Experiment

**What You Need:** Empty soda can with tab removed, Ice water, Pan, Mixing bowl, Tongs, Stove

**Caution! Experiment involves heat and boiling water, adult supervision required.**

### **What To Do:**

1. Rinse the soda can, then place a couple tablespoons of water inside it - just enough to cover the bottom of the can.
2. Place the can directly in a pan (use an old pan if you are worried about any damage caused by heating the can) and place on a stovetop burner. Turn the burner to medium-high heat. Allow the water in the can to heat.
3. Fill the mixing bowl with about two inches of ice water.
4. Once the water in the can is boiling (steam will be coming out of the can and you should be able to hear the "popping" sound of boiling water), use the tongs to remove the can from the pan and quickly (without splashing boiling water!) bring the can to the bowl of water, turn it upside down, and immerse the can in the cold water. The can should quickly be "crushed" by the cold water!
5. Still holding the can with the tongs, pull the can out of the water and observe how much water pours out of the can.
6. Tip: If the can doesn't crunch on the first attempt, repeat the experiment. Consider using a different can, placing less water in the can, making sure the water in the bowl is very cold, or heating the can in pan longer.



Challenge the girls to explain why the can was crushed. If they mention pressure and/or condensation they are off to a great start! Here's what happened:

Boiling the water in the can decreases the air pressure inside, creating a partial vacuum. The water vapor produced by boiling the water pushes air out of the can, creating a lower pressure system inside of the can. Immersing the can in the cold water causes the can to implode because the pressure exerted by the water and air outside the can is greater than the pressure inside the can.

Condensation also occurs when the water vapor inside the can (a gas) quickly cools when the can is immersed in the cold water. The water vapor rapidly condenses and turns the water vapor into liquid water again. The molecules of the liquid water droplets take up less space inside the can than the molecules of the gaseous water vapor, once again causing the can to be crushed by the greater external pressure exerted by the water in the bowl and air pressure around the can.

Hopefully the girls observe that more water came out of the can than was originally placed inside. The extra water was forced into the can as a result of the greater air pressure outside of the can.

From: [http://www.education.com/activity/article/Crunch\\_Can\\_middle/](http://www.education.com/activity/article/Crunch_Can_middle/)

## Curds and Whey: A Milky Experiment

**What You Need:** Measuring cup and spoons, Skim milk, Clear glass cup, White distilled vinegar

### **What To Do:**

1. Measure  $\frac{1}{4}$  cup of skim milk and pour it into the glass.
2. Measure 2 tablespoons of vinegar and pour into the milk.
3. Stir the vinegar and milk together then observe!
4. Extend the experiment by using other types of milk as well (1%, 2%, whole). Try curdling the milk with lemon juice, another weak acid. Are the results the same?

### **What Happened?**

Milk is a colloid. A colloid is a mixture of substances that do not settle out over time (like a mixture of sand and water would for example). Unlike a suspension (sand and water or orange juice and pulp) that mixes together when stirred or shaken then settles into separate parts when left at rest, a colloid does not settle because the particles that make it up are extremely tiny.

Looking at a glass of milk, one would not be able to see the particles that make it up, namely the curds (solid casein protein particles) and whey (liquid particles) because they are so small. (Interestingly, milk appears white even though the particles that make it up are mostly clear,

because light is scattered by the tiny particles as it passes through the colloid.) The milk was “curdled” when the acidic vinegar was added and lowered the pH of the milk, causing the casein particles to come out of the solution as solid chunks of curds floating in the liquid whey. Gross - definitely don't drink!

From: [http://www.education.com/activity/article/Curds\\_Whey\\_middle/](http://www.education.com/activity/article/Curds_Whey_middle/)

## Film Canister Rocket

**You'll need:** water, empty film canisters with lids, and Alka Seltzer tablets

**You can add if you choose:** large paper, washable paint

### **What to do:**

You fill the canister about 1/2 way with water. Quickly drop in the tablet, put the lid on all the way, place upside down, and RUN!

If you would like to add some art component to this here it is. After you add the water squirt some paint in. Place the lid on and shake it up to mix it. Then open the lid, place in tablet quickly place the lid on and place it upside down on a large piece of paper. You will be left with some paint exploded on your paper. You can repeat with another colour paint to your creation.

## Snacks

Preserved worms

Make up some jello and place in a small clear disposable cup. Put a gummy worm or oany other gummy creature and then place in fridge to set. Then serve your preserved science experiments.

## Mad Scientist Cupcakes

Have some premade cupcakes for the girls. Then have several icing colors and toppings, pop rocks, nerds, bacon bits, crushed potato chips, chocolate chips sprinkles, candies....anything you think would be good. Have them use their mad scientist skills to decorate and then eat their creations.

## Fruit Atoms

Using a melon baller make balls of different kinds of melons. Place on a dish and call them atoms!

## Mad Potion

Use any juice or soda and call it mad potion. You may want to add some fruit in like grapes and calling them atoms or eyeballs. If you mix it up in a punch you may want to freeze water in a glove and then place the frozen ice hand in the punch.

## Crafts

### Sun prints

You got these in your kits. You will place an object like a leaf on the paper or a piece of doily would be neat as well. Place in the sun and you will be left with a print.

### Catapult

#### **You'll need:**

10 craft sticks  
5 rubber bands  
1 lid (milk jug, soda bottle, etc)  
glue  
mini marshmallows



Committee 2013

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### What to do:

1. Stack 8 craft sticks and rubber band them together on each side.

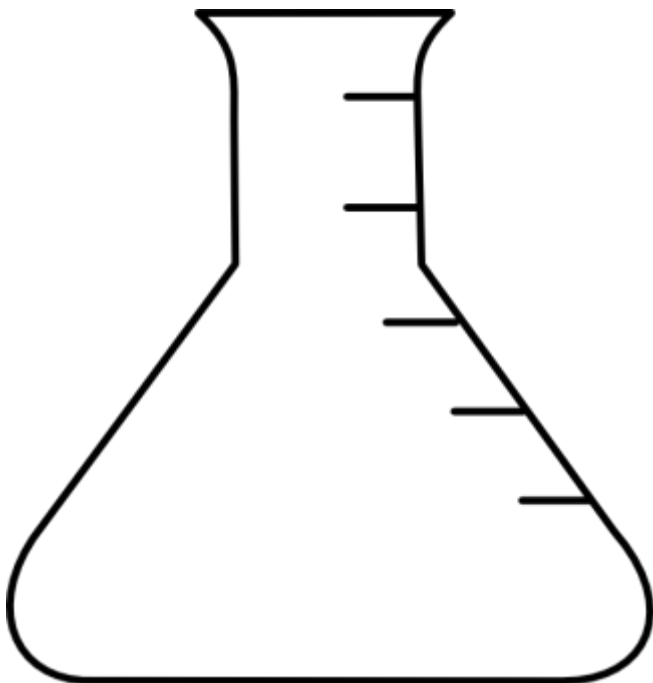
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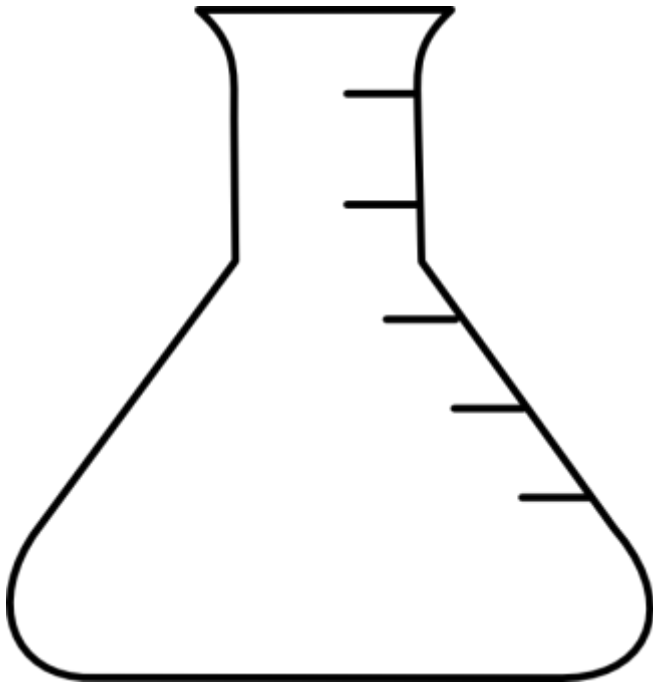
2. Take your remaining 2 craft sticks and rubber band them together, ***just on one end***.
3. Separate the open end of the 2-stick bundle and wedge the 8-stick bundle between them, pushing it up pretty far. You'll have to hold it like this, as the 2-stick bundle will want to push out the 8-stick.
4. Holding it steady, rubber band one way diagonally across both bundles and then the other way, forming an X of rubber bands in the center.
5. Glue the lid to the end of one stick, making sure to leave a little bit of the stick showing at the end (otherwise you'll press on the lid every time you fling, and the lid will fall off and how sad would that be to have to wait for glue to dry *again* before flinging?).

**THEN YOU FLING!** From: <http://the-giggling-green-bean.com/blog/?p=682>

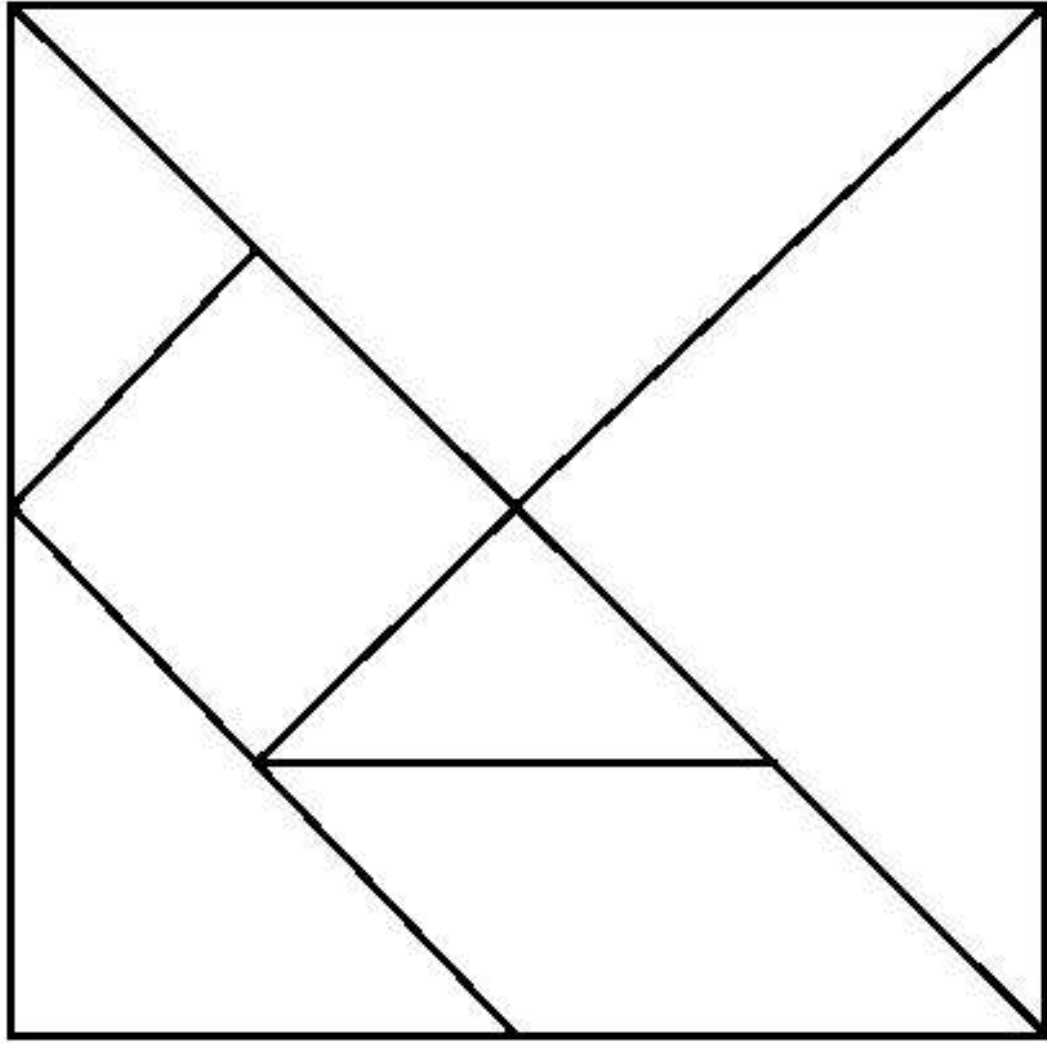
### Nametags Template

Simply copy on different colors of paper for different groups. Write name and use a small safety pin to pin on shirt or hat. If you are putting them on a hat you may want to laminate them so the girls have them on their hats for years to come.

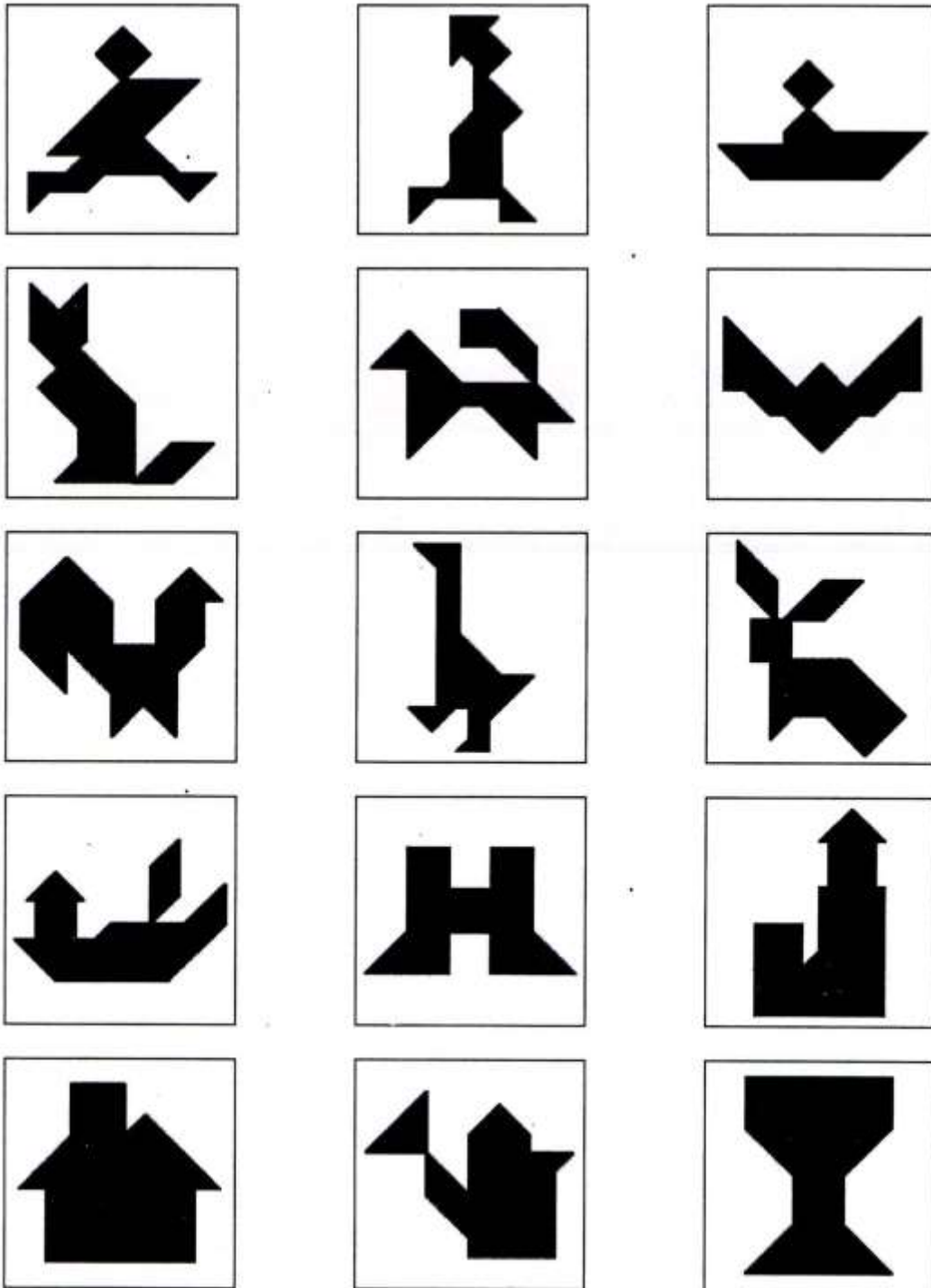




## Tangram Activity



Tangram puzzles



Tangram solutions

