RAINBOW SCIENCE JOURNAL

Cover Directions:
On the cover of your rainbow science journal, draw your favorite color. You can draw something that is the same color as your favorite color. You could also draw how you feel when you see your favorite color. Add as many details as possible.

Writing Page Directions:
What is your favorite color? Why is it your favorite color? How does your favorite color make you feel?

RAINBOW JOURNAL

MY FAVORITE COLOR

MY FAVORITE COLOR

RAINBOW STEM

Challenges & Engineer's Notebook

LITTLE BINS FOR LITTLE HANDS

Rainbow Challenge Supply List

- Acrylic paint
- Aluminum foil
- Baking soda
- Baggies
- Beads
- Bows
- Buttons
- Clothes pins
- Coffee filters
- Cookie cutters
- Cornstarch
- Cotton balls
- Cotton swabs
- Craft paper
- Craft sticks
- Doilies
- Dried cereal
- Dried pasta
- Eye dropper
- Fabric
- Feathers
- Felt
- Flat marbles
- Food coloring
- Funnel
- Gems
- Glitter
- Glitter glue
- Glow sticks
- Glue
- Golf tees
- Google eyes
- Gumballs
- Gumdrops
- Gummy worms
- LEGO® bricks
- Lollipop sticks
- Magnets
- Marbles
- Measuring cups
- Needle and thread
- Paint
- Paper
- Paper cups
- Paper clips
- Pencil
- Pipe cleaners
- Plastic eggs
- Play dough
- Pom-poms
- Pretzel Sticks
- Raffia
- Ribbon
- Rubber Bands
- Seed beads
- Scissors
- Sequins
- Shells
- Shredded paper
- Skewers
- Spice jars
- Sponges
- Stapler
- Strainer
- Straws
- String
- Styrofoam balls
- Sugar cubes
- Tape
- Tape measure
- Tea lights
- Tin can
- Toilet paper rolls
- Toothpicks
- Twist ties
- Candy (variety)
- Washi Tape
- Water
- Water beads
- White vinegar
- Wire
- Wooden planks
- Yarn
- Zip ties

Build a Rainbow Bridge

Challenge: Build a rainbow bridge that will span a gap and hold a roll of pennies (or other predetermined weight).

Possible Supplies:

Pipe cleaners, play dough, blocks, craft paper, straws, toothpicks, skewers, craft sticks, wooden blocks, buttons, markers, paint, crayons

Build a Rainbow Boat

Challenge: Build a rainbow boat that will float and hold a roll of pennies (or other predetermined weight).

Possible Supplies: balloons, foil, fabric, rubber bands, LEGO bricks, wooden planks, twist ties, zip ties, balloons, toothpicks, craft sticks, skewers

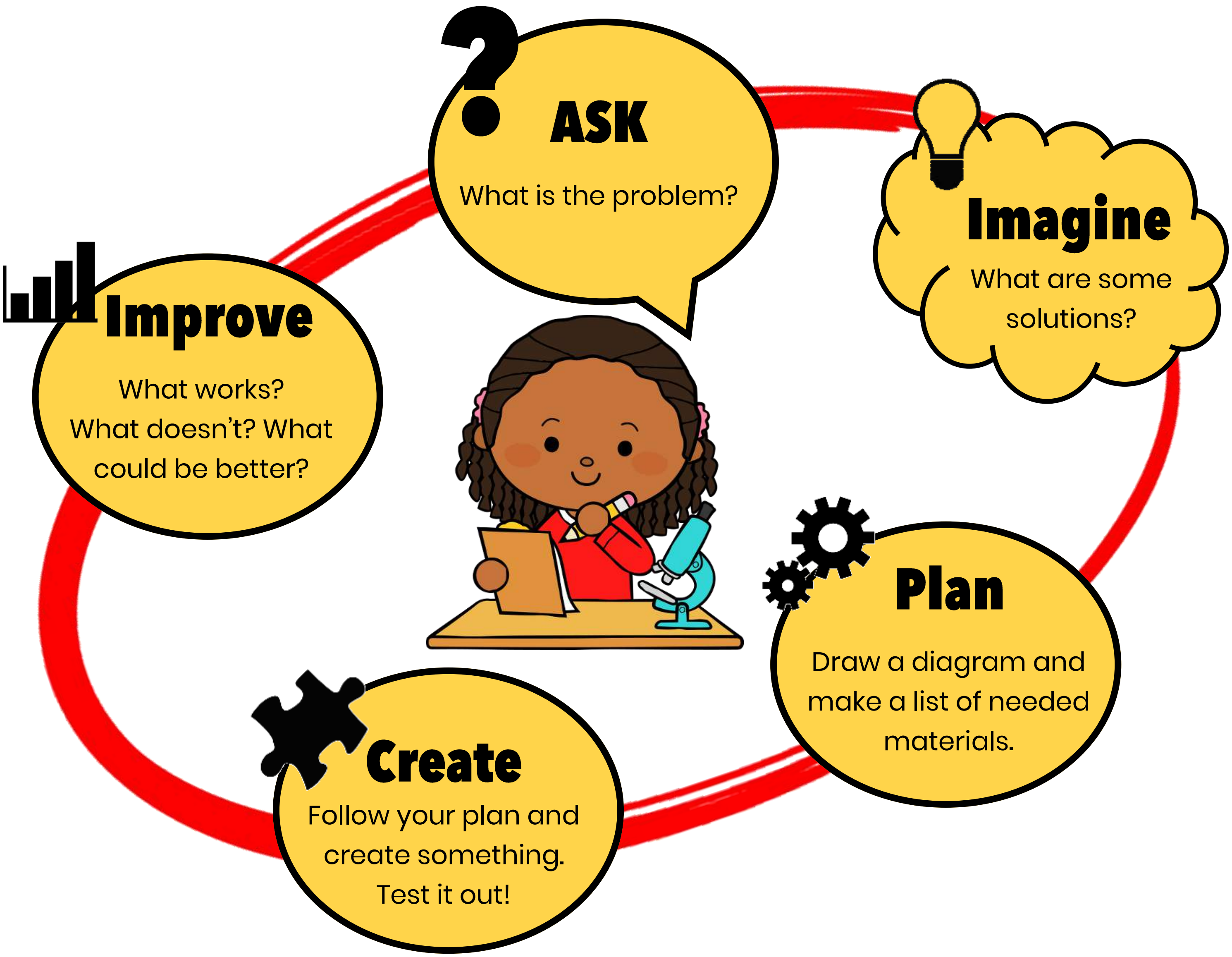
Build a Rainbow Tower

Challenge: Build a rainbow tower that is at least 12" tall and uses all of the colors of the rainbow. Can it support a tennis ball on top?

Possible Supplies: craft sticks, markers, gum drops, toothpicks, LEGO bricks, crayons, zip ties, twist ties, buttons, pom-poms

You can use the other STEM challenges from the pack with the engineer's notebook.

Engineering Design Process



Engineering Design Process

ASK

What is the problem?

What do I need to know?

How can I solve the problem?

Imagine

What information will I need?

What are some solutions?

How can I solve the problem?

Plan

What things do I need to use?

Draw a diagram and make a list of needed materials.

Create

Follow your plan and create something.

Test it out!

Improve

What changes can I make to make it better?

My STEM Challenge:

ASK

What's the problem?

BRAINSTORM AND RECORD possible solutions, as many as you can.

Imagine

My STEM Challenge:

Plan

Draw a diagram and make a list of needed materials.

My STEM Challenge:

Plan

Make a plan for solving your problem.

My STEM Challenge:

Create

Look at the materials provided for use in creating your models.

My STEM Challenge:

Improve

Create a new drawing incorporating your ideas as well as the feedback you received on your prototype. Create an improved version of your original model.

RAINBOW STEM SUPPLY LIST

- Acrylic paint
- Aluminum foil
- Baking soda
- Baggies
- Beads
- Bows
- Buttons
- Clothes pins
- Coffee filters
- Cookie cutters
- Cornstarch
- Cotton balls
- Cotton swabs
- Craft paper
- Craft sticks
- Doilies
- Dried cereal
- Dried pasta
- Eye dropper
- Faux plants
- Feathers
- Felt
- Flat marbles
- Food coloring
- Funnel
- Gems
- Glitter
- Glitter glue
- Glow sticks
- Glue
- Golf tees
- Google eyes
- Gumballs
- Gumdrops
- Gummy worms
- LEGO® bricks
- Lollipop sticks
- Magnets
- Marbles
- Measuring cups
- Needle and thread
- Paint
- Paper
- Paper cups
- Paper clips
- Pencil
- Pipe cleaners
- Plastic eggs
- Play dough
- Pom-poms
- Pretzel Sticks
- Raffia
- Ribbon
- Rubber Bands
- Seed beads
- Scissors
- Sequins
- Shells
- Shredded paper
- Skewers
- Spice jars
- Sponges
- Stapler
- Strainer
- Straws
- String
- Styrofoam balls
- Sugar cubes
- Tape
- Tape measure
- Tea lights
- Tin can
- Toilet paper rolls
- Toothpicks
- Twist ties
- Candy (variety)
- Washi Tape
- Water
- Water beads
- White vinegar
- Wire
- Wooden planks
- Yarn
- Zip ties

DESIGN A 2D RAINBOW

Possible Supplies:
paper, beads, Washi tape, foil, paint, markers, cotton, glitter, glitter glue, tape, sequins, pom-poms,

DESIGN AND BUILD A 3D RAINBOW

Possible Supplies:
paper tubes, paper, glitter, pom-poms, Styrofoam balls, paint, golf tees, baggies, dried cereal, dried pasta

RAINBOW SCAVENGER HUNT

Find and collect items that match the colors of the rainbow.

Red
Orange
Yellow
Green
Blue
Indigo
Violet

BUILD A LEGO® RAINBOW

Supplies:
LEGO bricks

BUILD A 3D PAPER RAINBOW

Possible Supplies:
Craft paper, Washi tape, tape, glue, glitter, glitter glue, paper tubes,

BUILD A CANDY RAINBOW

Using candy build an arched rainbow structure.

Possible Supplies:
gumballs, skittles, gumdrops, gummy worms, toothpicks, skewers, lollipop sticks, dried pasta

BUILD A RAINBOW WITH ONLY 2 ITEMS

Possible Supplies:
Pipe cleaners, play dough, blocks, craft paper, buttons, sequins, glitter pom-poms, paint, beads, sponges, straws, doilies, marbles, food coloring

BUILD A RAINBOW BRIDGE

Design and build a bridge in the shape of a rainbow.

Possible Supplies:
Pipe cleaners, play dough, blocks, craft paper, straws, toothpicks, skewers, craft sticks, wooden blocks, buttons, markers, paint, crayons

Make a Rainbow

Supplies Needed:

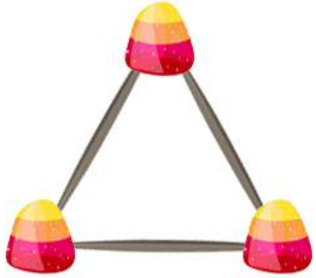
- Scissors,
- Ruler
- Brads,
- Hole Puch,
- Strips of colored paper in 10, 9, 8, 7, 6, 5, and 4 inch strips.
  (You can cut and color your own, or use the provided strips.)

Procedure:

1. Measure and cut each strip of paper. If you are doing your own, color the strips
in the following order.
    - 10 inch—red
    - 9 inch-orange
    - 8 inch-yellow
    - 7 inch –green
    - 6 inch-blue
    - 5 inch-indigo
    - 4 inch-violet
2. Punch a hole in the end of each strip.
3. Stack the strips so that the lonest strip is on top.
4. Line up the holes on one end and attach the brad.
5. Then bend the strips in order to line up the holes on the other end, and attach the brad.

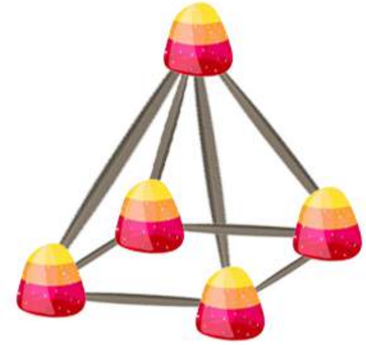
CREATE A TRIANGLE (2D)

YOU NEED



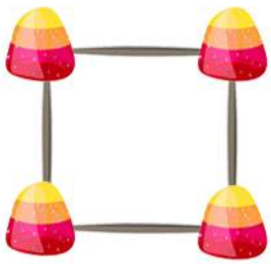
CREATE A PYRAMID (3D)

YOU NEED



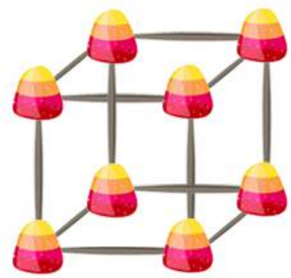
CREATE A SQUARE (2D)

YOU NEED



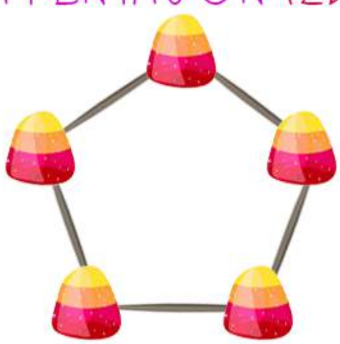
CREATE A CUBE (2D)

YOU NEED



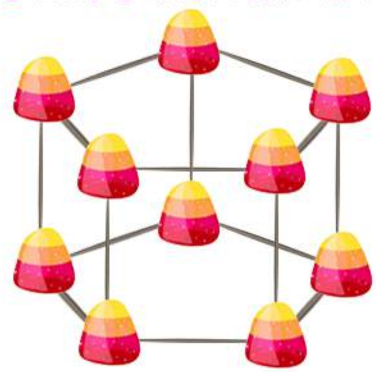
CREATE A PENTAGON (2D)

YOU NEED



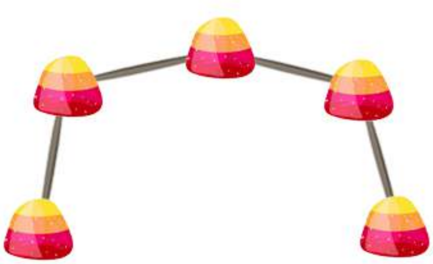
CREATE A PENTAGONAL PRISM (3D)

YOU NEED



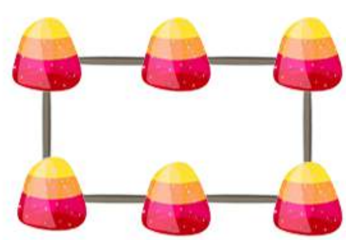
CREATE AN ARCH (2D)

YOU NEED



CREATE A RECTANGLE (2D)

YOU NEED



RAINBOW SCIENCE & STEM PROJECTS

Introduction

Welcome to your Rainbow STEM Pack! I hope it sparks creativity and curiosity within your young scientists, engineers, and inventors.

You will find an abundance of Rainbow themed science and STEM activities for K-2nd grade. I have added instructions and extra information to several of the packs.

Feel free to use this pack with one junior scientist or a whole group of junior engineers. You may copy activities as many times as you like for your class, but please send your friends to grab their own pack instead of sharing files. Visit LittleBinsforLittleHands.com for more fun ideas.

Because I know kids love the novelty of the changing seasons and holidays, I have created and re-created many kid-favorite and classic science activities with special or unique themes to fit different occasions.

Join us as we explore a bit of science and STEM with rainbows. In these pages, you will find multi-sensory, hands-on learning experiences you can try over and over again each season.

Easy to set up, inexpensive, and **PERFECT for fun and educational science.**

Rainbow Science Guide

What is the best way to use these science activities?

Print out the STEM materials and let the kids get busy! Encourage using the STEM design process (included) to extend the activity for older kids.

Many of these activities are playful. Some activities can take as little as 5-10 minutes or as long as an hour if your kids are still having fun observing, exploring and experimenting.

Don't forget to visit the dollar store and craft stores often to find fun accessories you can incorporate into your STEM studies.

You can also fill a bin with recycled and up-cycled items for future projects. Then, you always have a stock of neat materials available for use.

Safety Guide

While all the ingredients in this Rainbow Science and STEM guide are easy to find at your local stores. I always recommend **adult supervision and assistance** at all times depending on the abilities and needs of each child.

- Be prepared to get a little messy.
- Stock your pantry with all the ingredients you need.
- Read through the instructions or recipe thoroughly before starting the process.
- Do NOT eat or drink any of these activities, unless indicated by the activity.
- Wash hands thoroughly after all activities.
- Wash all surfaces, utensils, and bowls thoroughly after activities.
- Protective eyewear is always recommended and perfect for junior scientists.

FUN SCIENCE & STEM!

AMAZING sensory rich experiences!
EASY to find supplies!
Simple to set-up science ideas and fun STEM projects!

SIMPLE SCIENCE

- Rainbow Carnation
- Rainbow Celery
- Rainbow Walking Water
- Rainbow Magic Milk
- Erupting Rainbow
- Crystal Rainbow
- Rainbow Oobleck
- Skittles® Rainbow
- Skittles® Rainbow in a Jar
- Rainbow Density Tower
- Make Rainbows

ALWAYS BE SAFE!

Make sure you have an appropriate workspace and the correct supplies or ingredients.

Always ask for adult help before trying any science activity.

MY EXPERIMENT:

Materials I Used:

What I think will happen:

MY EXPERIMENT:

What I did:

What I saw:

MY EXPERIMENT:

Draw it:

MY EXPERIMENT:

What happened:

MY EXPERIMENT:

What happened:

These science activity cards are designed to be printed double sided on 8.5 x 11

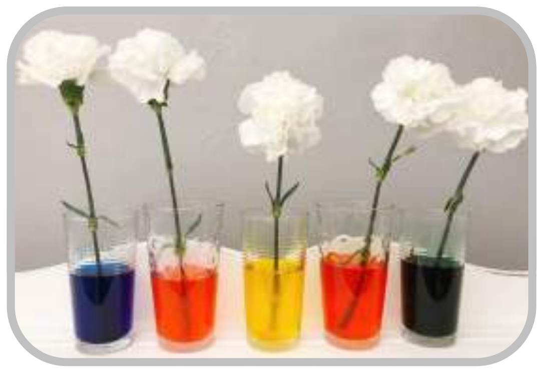
Rainbow Carnations

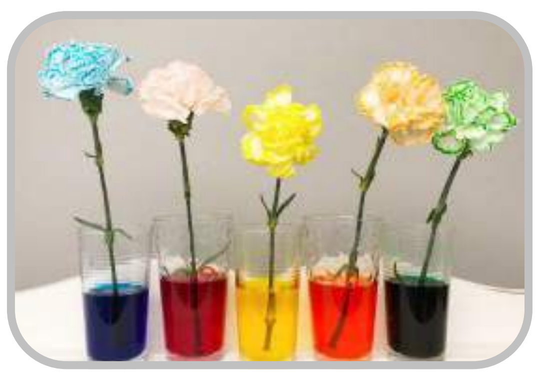
YOU WILL NEED:

- White Carnations
- Food coloring
- Water bottles, jars, or glasses
- Scissors

DIRECTIONS:

1. Trim the stems of the carnations at an angle under water.
2. Squirt several drops of food coloring into each container, fill halfway with water, and mix.
3. Add one carnation to each container! You may notice changes in color after only one hour.





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What's Happening?

THE SCIENCE BEHIND RAINBOW CARNATIONS:

Plants are filled with cells and the water moves through the cells and cell walls by the process of osmosis. This process of filling the cells also stiffens the stalks, stems, and leaves. This is known as turgor pressure.

Without water, the cells lose their shape because this pressure is not there without the necessary water. If you see a wilted or droopy looking plant this is what's happening! Give it some water and observe the results!

A plant drinks water through its stem and provides it to the flowers and leaves. Water travels up tiny tubes in the stem by a process called Capillary Action.

Capillary Action is the movement of liquids like the colored water along a surface which is the tubes in the stem. This is how a plant gets its water!

As water evaporates on a plant, it is able to be pulled up in the plant's stem (transpiration). As it does so, it attracts more water to come along (cohesion).

THINK ABOUT IT:

Think about what you've learned. What other types of plants can you experiment with to see how Capillary Action works?

Brainstorm different plants, vegetables, and flowers. Select a few and try repeating the experiment.

Document the results.

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Rainbow Celery

YOU WILL NEED:

- Celery stalks
- Food coloring
- Water
- Tall glasses

DIRECTIONS:

1. Cut the bottom of your celery stalks.
2. Add a few drops of food coloring to each glass, fill half way with water and mix.
3. Place the celery in the colored water and wait overnight to a couple days and watch the difference.

What's Happening?

THE SCIENCE BEHIND RAINBOW CARNATIONS:

A plant drinks water through its stem and provides it to the flowers and leaves. Water travels up tiny tubes in the STEM by a process called Capillary Action.

Capillary Action is the movement of liquids like the colored water along a surface which is the tubes in the stem. This is how a plant gets its water!

As water evaporates on a plant, it is able to be pulled up in the plant's stem (transpiration). As it does so, it attracts more water to come along (cohesion).

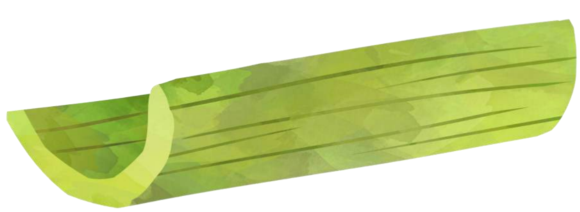
THINK ABOUT IT:

What can you do to alter this activity to change the results? Could you try warm water, or ice water? What would happen?

Compare results using different types of white flowers.

Does the type of flower make a difference?

Keep the type of white flower the same but try different colors in the water to see if that makes a difference.



Rainbow Walking Water

YOU WILL NEED:

- 6 Clear plastic cups or jars
- Paper Towels
- Water
- Food coloring

DIRECTIONS:

1. You will need two sets of primary colors. Add red, yellow, and blue food coloring (one color per cup) in a pattern. Give each cup a little stir to evenly distribute the color. Put the same amount of food coloring in each cup.

2. Cut strips of paper towel to fit in the cups and place the strips into the test tubes. There will be two ends in each cup.
3. Wait and watch what happens. At this point, you can set up a stopwatch to make note of how long it takes for the colors to meet and mix.

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What's Happening?

THE SCIENCE BEHIND OF THE WALKING WATER EXPERIMENT:

The science of walking water is all about capillary action which is also seen in plants. The colored water travels up the fibers of the paper towel. These gaps are similar to the capillary tubes of a plant that pull the water up through the stems.

The fibers of the paper towel help the water to move upward. This is why this walking water science experiment looks like it is defying gravity. How else does water move up the tree?

As the paper towels absorb the colored water, the water travels up the towel strip. It meets up with the other colored water that has traveled up the from the opposite side.

Where the primary colors interact they turn into the secondary colors. Both colors will travel as long as the towel fibers absorb the water. Once the towels are fully saturated no more water can travel through the fibers.

THINK ABOUT IT:

Do you think it's possible to alter the results of this experiment?

What would happen if you used different volumes of water in each glass?

If you kept the same volume but changed the height of the glasses by setting some on books of varying heights, what would the results be?

What might happen with different forms of paper products? You could try copy paper, construction paper, or even tissues.

Choose an alternate version of the experiment and try it again.

Record your results.

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Rainbow Magic Milk

YOU WILL NEED:

- Whole milk
- Food coloring
- Dish soap
- Cotton swabs

DIRECTIONS:

1. Start by pouring the milk into a shallow container or dinner plate to about a 1/4 inch in depth.
2. Next, add food coloring drops to the surface of the milk, but don't stir or mix them into the milk!
3. Take a cotton swab and dip it into the dish soap. Lightly touch the surface of the milk. Watch what happens!

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What's Happening?

THE SCIENCE BEHIND THE RAINBOW MILK EXPERIMENT:

Milk is made up of minerals, proteins, and fats. Proteins and fats are susceptible to changes.

When the dish soap is added to the milk, the soap molecules run around and try to attach to the fat molecules in the milk.

You wouldn't see this without the food coloring. The food coloring looks like fireworks because it's getting bumped around by the movement of the soap and milk molecules.

THINK ABOUT IT:

Did you use up all fat molecules the first time you did the experiment? To see if you did, repeat the process with another cotton swab and soap to see if there are any milk fat molecules the soap didn't bind with.

What happens if you use 2%, 1% or skim milk? Will you see the same results?

Experiment with different milk fat percentages.

Also, you can test this experiment using different types of milk such as almond, cashew, soy or oat milk.

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Erupting Rainbow

YOU WILL NEED:

- Baking soda
- White vinegar
- Food coloring
- 6 Small clear plastic cups

DIRECTIONS:

1. Set out a tray with six clear plastic cups (or jars) in a rainbow shape if desired.
2. Next, add food coloring to your pots! Alternatively, you can color 6 containers of vinegar that the kids can slowly pour into each pot of baking soda.
3. Once the food coloring is added or if you have decided to use separate containers for colored vinegar, scoop 1-2 T. of baking soda into each pot.
4. Pour or squeeze vinegar into each pot for the colorful chemical reaction!

These science activity cards are designed to be printed double sided on 8.5 x 11 paper.

What's Happening?

THE SCIENCE BEHIND THE ERUPTING RAINBOW EXPERIMENT:

The science behind this fizzing and erupting rainbow activity is all about chemical reactions and states of matter!

When the vinegar (an acid) and the baking soda (a base) mix together, they form a gas called carbon dioxide. The fizzing and bubbling that you can see and even feel, if you put your hand close enough, is the gas being released as a result of the mixture's reaction.

In this activity, all three states of matter are present: liquid (vinegar), solid (baking soda), and gas (carbon dioxide).

THINK ABOUT IT:

Think about what you have learned.

What would happen if you repeated the experiment only this time you put the vinegar in the pot first with the food coloring. Then, spoon the baking soda on top of the vinegar. Would you get the same or different result?

Why? Explain your answer.

Would lemon juice work? What about water, or milk?

These science activity cards are designed to be printed double sided on 8.5 x 11

Crystal Rainbow

YOU WILL NEED:

- Borax powder (found with laundry detergent)
- Water
- Jars or vases
- Craft sticks
- Pipe cleaners
- Baster, squeeze bottle or ladle, tray

DIRECTIONS:

Safety Note: Adult assistance is highly suggested when handling borax powder and hot water! You can use very hot water (instead of boiling), but the crystal growth will not be as good.

1. Shape your pipe cleaners into a rainbow. Add clouds if desired! Use a craft stick to suspend the shape in the jar as seen in pictures.
2. Boil the water and measure the Borax into a bowl. You will want 3 tablespoons of Borax for every cup of water.
3. Measure and pour the boiling water into the bowl with the Borax powder. Stir the solution until the powder dissolves as much as possible. It will be very cloudy looking.
4. Carefully pour the liquid into a jar (or jars). Add a pipe cleaner rainbow to each jar and make sure it is fully covered by the solution. Place the jar/s in a safe place where they won't be disturbed.

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What's Happening?

THE SCIENCE BEHIND THE CRYSTAL RAINBOW:

Borax is a natural chemical compound, sodium tetraborate. The mixture of borax and water mixture is called a saturated solution.

While the liquid is hot the borax is suspended throughout the solution. More borax can be dissolved in hot liquid than in cold liquid. This is because in hot liquid the space between molecules is larger, which means there is more room between molecules for the borax particles to dissolve.

As the solution cools, the particles settle out of the saturated mixture. The settling particles form crystals and adhere to the pipe cleaner. These crystals can be seen, felt, and touched.

THINK ABOUT IT:

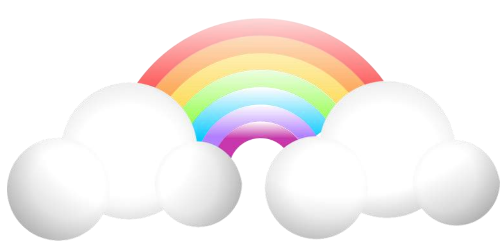
Think about what you've learned.

What would happen if you used cold water for your mixture? What about warm water?

Could you add food coloring to the water? If so, would that change the color of the crystals?

Experiment making crystals with other compounds.

Suggested compounds: salt, sugar, Epsom salt, alum



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Rainbow Oobleck

YOU WILL NEED:

- 2 Cups of cornstarch (per color or you can half the recipe)
- 1-1.5 Cups of water (per color or you can half the recipe)
- Food coloring

DIRECTIONS:

1. Start by adding 1.5 cups of cornstarch to the bowl. A 2:1 ratio works well, but keep extra cornstarch on hand for testing different ratios of cornstarch to water.
2. Add food coloring to 1 cup of water. For a bold color use extra food coloring.
3. Next add the water and get ready to mix. This can be messy and your hands may be easier than a spoon. Start with 1 cup of water first and then add more water as needed.
4. If you add too much cornstarch, go ahead and add some water back in. Or, add more cornstarch if you have too much water. A little can go a long way once you start incorporating it into the mixture.
5. Your oobleck should be neither too runny or too stiff and dry.
6. Can you pick up a clump? Yes, but then it oozes back into the bowl? Then you have a good oobleck on your hands.

These science activity cards are designed to be printed double sided on 8.5 x 11 paper.

What's Happening?

THE SCIENCE BEHIND THE RAINBOW OOBLECK:

Is it a solid or a liquid? The answer is it's both, and it's neither. Oobleck is a fun substance made from a mixture of cornstarch and water. Here you are combining a liquid and a solid, but the mixture doesn't become one or the other.

A mixture is a material made up of two or more substances to form a new material which in this experiment is your oobleck! A solid has its own shape whereas a liquid will take the shape of the container it is put into. Oobleck is a bit of both.

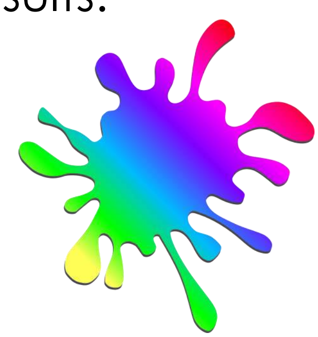
Oobleck is called a non-Newtonian fluid. This means it is neither a liquid nor a solid. You can pick up a clump of the substance like a solid and then watch it ooze back into the bowl like a liquid. Touch the surface lightly and it will feel firm and solid. If you apply more pressure, your fingers will sink into it like a liquid.

THINK ABOUT IT:

Can the oobleck substance ever be separated? If so, how?

Document your theory.

Then, plan how you can test the theory to separate the oobleck. Record your results.



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Skittles® Rainbow

YOU WILL NEED:

- Skittles®
- Water
- White plates or baking dishes (flat bottom is best)
- Cookie cutters (optional)
- Alternatively, M&M's® work well too!

DIRECTIONS:

1. Arrange the Skittles® in a rainbow pattern around the edge of the plate alternating colors in any number they like- singles, doubles, triples, etc.
2. Pop in a rainbow shaped cookie cutter to the center of the plate just to add a little more fun to the theme and some additional color. You can even place a single candy or two in the center of the cookie cutter. No cookie cutter is fine too!
3. Carefully pour water into the center of cookie cutter/plate until it just covers the candy. Be careful not to shake or move the plate once you add the water or it will disturb the effect.
4. Watch as the colors stretch and bleed out away from the Skittles®, coloring the water.
   What happened? Did they mix?

These science activity cards are designed to be printed double

What's Happening?

THE SCIENCE BEHIND THE SKITTLES® RAINBOW:

Skittles® science demonstrates a process called stratification. The simple definition is that stratification is the arrangement of something into groups. Specifically, this is water stratification, and water has different masses with different properties that create the barriers you see within the different colors of candies.

The coating of the candy is made up of mostly sugar and food coloring. The water dissolves the sugar and the coloring diffuses into the water. Each color creates a water solution with slightly different properties.

Note: over time the colors will eventually mix.

THINK ABOUT IT:

What if you used other liquids? Do you think warm water would work better or worse?

Alternate experiment:

Try using clear soda instead of water.

Skittles® Rainbow in a Jar

YOU WILL NEED:

- Skittles®
- Hot water
- Measuring cup
- Eye dropper or pipette
- Small clear glass jar
- 5 small bowls

DIRECTIONS:

1. Start by pouring the Skittles® into a bowl or onto a plate. You will need the following amounts per color:
   - 12 pink/red
   - 10 blue
   - 8 green
   - 6 orange
   - 4 yellow
2. Add each color to a separate small bowl.
3. Measure 1/4 cup of hot water to each bowl of skittles and let set for several hours until the Skittles® have fully dissolved. The hot water will quicken the dissolving process.
4. Stir each bowl and use a eye dropper or pipette to slowly add the colors to the jar from most amount of Skittles® to least amount of Skittles®.

These science activity cards are designed to be printed double

What's Happening?

THE SCIENCE BEHIND THE SKITTLES® RAINBOW:

Skittles® science demonstrates a process called stratification. The simple definition is that stratification is the arrangement of something into groups. Specifically, this is water stratification, and water has different masses with different properties that create the barriers you see within the different colors of candies.

The coating of the candy is made up of mostly sugar and food coloring. The water dissolves the sugar and the coloring diffuses into the water. Each color creates a water solution with slightly different properties.

Note: over time the colors will eventually mix.

THINK ABOUT IT:

What if you used other liquids? Do you think warm water would work better or worse?

Alternate experiment:

Try using clear soda instead of water.

These science activity cards are designed to be printed double sided on 8.5 x 11

Rainbow Density Tower

YOU WILL NEED:

- Honey
- Light corn syrup - colored red
- Dish soap (blue)
- Water - colored green
- Vegetable oil
- Rubbing alcohol - colored yellow
- Clear lamp oil (optional)
- Food coloring
- Clear glass jar

DIRECTIONS:

1. Pour a 1/2 cup of honey into the bottom of your jar. Mix 1/2 cup of corn syrup with red food coloring and pour it onto the center of the honey.
2. Squeeze a 1/2 cup of blue dish soap slowly onto the corn syrup.

3. Mix a 1/2 cup of water with green food coloring. Use a baster or pipette to slowly drop the water down the inside side of the jar onto the dish soap (or else bubbles will form).
4. Wash and use the baster or pipette to add a 1/2 cup of vegetable oil onto the water. Make sure to drip it along the inside side of the jar.

5. Mix a 1/2 cup of rubbing alcohol with yellow food coloring. Wash the baster or pipette and use it to drip it down the inside side of the jar.
6. Wash the baster or pipette again and use it to drip a 1/2 cup of lamp oil down the inside side of the jar.

These science activity cards are designed to be printed double

What's Happening?

THE SCIENCE BEHIND OF THE INFLATING BALLOONS EXPERIMENT:

What is density?

We know this liquid density tower deals with the state of liquid matter (matter also includes solids and gasses).

Matter has different densities. This means some liquids, solids, or gases can be heavier and some are lighter. It's hard to imagine that different liquids have different weights, but they do.

Like solids, liquids are made up of different numbers of atoms and molecules. In some liquids, these atoms and molecules are packed together more tightly resulting in a denser or heavier liquid like the honey.

These different liquids always separate because they are not the same density and this separation forms the layers of color in the jar!

THINK ABOUT IT:

What other types of liquid could you use to create a liquid density tower? Think of things use around your home every day. What liquids could be used to create a density tower?

After you've brainstormed, you can try various liquids to see if you get similar results.

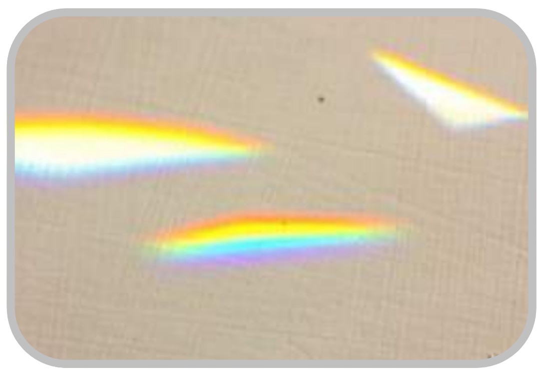
Safety Note: Not all liquids in your home are safe for use in experimentation. Always check with a trusted adult before mixing liquids together.

These science activity cards are designed to be printed double sided on 8.5 x 11

Make Rainbows

YOU WILL NEED:

- Clear glass filled all the way with water
- White sheet of paper
- Flashlight
- CD



DIRECTIONS USING CD:

1. Hold the CD in the sunshine or a beam of light in your room.
2. Alternatively, you can shine your flashlight at the CD. Your best bet is to do this in an area with a white wall or you can hold a piece of white paper so that the light reflecting off the CD shines onto the paper.
3. Observe a dazzling display of color!

DIRECTIONS USING GLASS OF WATER:

1. Place the glass of water on the sheet of white paper. Take your flashlight move it around until you see a rainbow appear on the white paper.

These science activity cards are designed to be printed double

What's Happening?

THE SCIENCE BEHIND MAKING RAINBOW:

White light appears to have an absence of color. But it is actually made up of many colors. It contains all the wavelengths of the visible spectrum of colors.

The CD separates white light into all the colors that make it up. Light is made of waves and when the light waves reflect on the CD, they create certain colors.

When the white light passes through water, the light waves bend resulting in a rainbow of colors that appear on the paper.

Why does a rainbow appear? A rainbow appears when the light waves get split up into the 7 different colors red, orange, yellow, green, blue, indigo and violet.

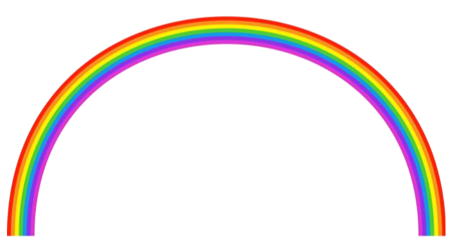
This usually happens because the light waves are bending through a substance like water. When a rainbow in the sky appears it is because the light from the sun is shining through moisture in the air at just the right angle to refract the colors.

THINK ABOUT IT:

A rainbow forms when light is either refracted or reflected and just the right angle. What else can you use to make a rainbow?

Test these items to see how your results might be different.

- mirror
- prism
- crystal



BEST SCIENCE AND ENGINEERING PRACTICES

1. I CAN ASK QUESTIONS

2. I CAN DEVELOP AND USE MODELS

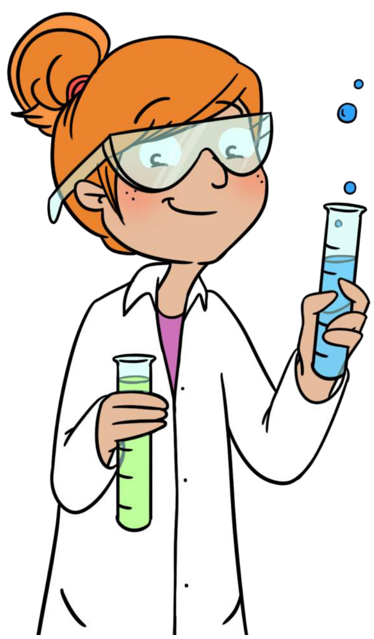
3. I CAN PLAN AND CARRY OUT INVESTIGATIONS

4. I CAN ANALYZE AND INTERPRET DATA

5. I CAN USE MATH AND COMPUTATIONAL THINKING

6. I CAN CONSTRUCT EXPLANATIONS

7. I CAN ENGAGE IN ARGUMENTS FROM EVIDENCE



8. I CAN OBTAIN, EVALUATE, & COMMUNICATE INFORMATION

1. I can **ask questions**.	2. I can **develop** and **use models**.
3. I can **plan** and **carry out investigations**.	4. I can **analyze** and **interpret data**.
5. I can use **math** and **computational thinking**.	6. I can **construct explanations**.
7. I can **engage** in **arguments** from **evidence**.	8. I can **obtain**, **evaluate**, and **communicate information**.

1. I can **ask questions**.	2. I can **develop** and **use models**.
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5. I can use **math** and **computation al thinking**.	6. I can **construct explanations**.
7. I can **engage** in **arguments** from **evidence**.	8. I can **obtain, evaluate**, and **communicate information**.

BEST SCIENCE AND ENGINEERING PRACTICES

It is important to note that the scientific method is not a linear set of steps, and you can adapt it to fit your investigation.

1. I can ask questions.
2. I can develop and use models.
3. I can plan and carry out investigations.
4. I can analyze and interpret data.
5. I can use math and computational thinking.
6. I can construct explanations.
7. I can engage in arguments from evidence.
8. I can obtain, evaluate, and communicate information.

THE SCIENTIFIC METHOD, BEST SCIENCE PRACTICES, AND LEARNING!

What is science, and why should we learn it?

The word "science" comes from the Latin word that means "knowledge" . So science is all about gaining knowledge about the world around us. We know kids love to ask questions about what they see!

The word "method" comes from the Greek word that means "road". A method is all about the route you take to get someplace, but is it a road map?

If you put the two words together, science and method, you get a new term called "scientific method". This term is used to talk about a series of steps to use as a way to figure things out or to gan knowledge.

The scientific method is a useful tool for introducing kids to a logical way to solve scientific problems. The steps are helpful for guiding the process, but "guide" is the key here. It's important to understand that the scientific method is not a linear set of steps and can be adapted to suit the needs of a variety of investigations.

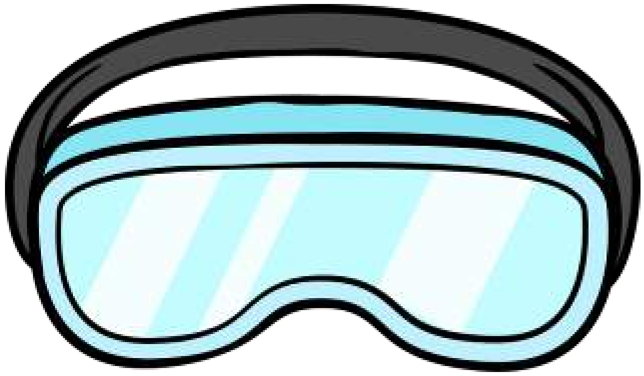
There are many ways scientists look to gain knowledge. It is important to allow kids to use the practices with what they are learning. This process will encourage the use of higher-order thinking skills for creating, evaluating, and analyzing. As kids develop the practices of questioning, gathering data, analyzing, and communication, they can apply these critical thinking skills to any situation. Now that's a winner!

* Note: You might be familiar with the more traditional version which includes some similar practices but in a linear format. These steps include asking questions, developing a hypothesis, conducting research, doing experiments and tests, analyzing data, and drawing conclusions.

However, the following eight science practices are less structured and allow for a more free-flowing approach to problem-solving and finding answers to questions.

GRAPHICS CREDIT

CLEVER CAT CREATIONS



Scientific Process

Ask a Question

What do you want to learn or test?

Do Some Research

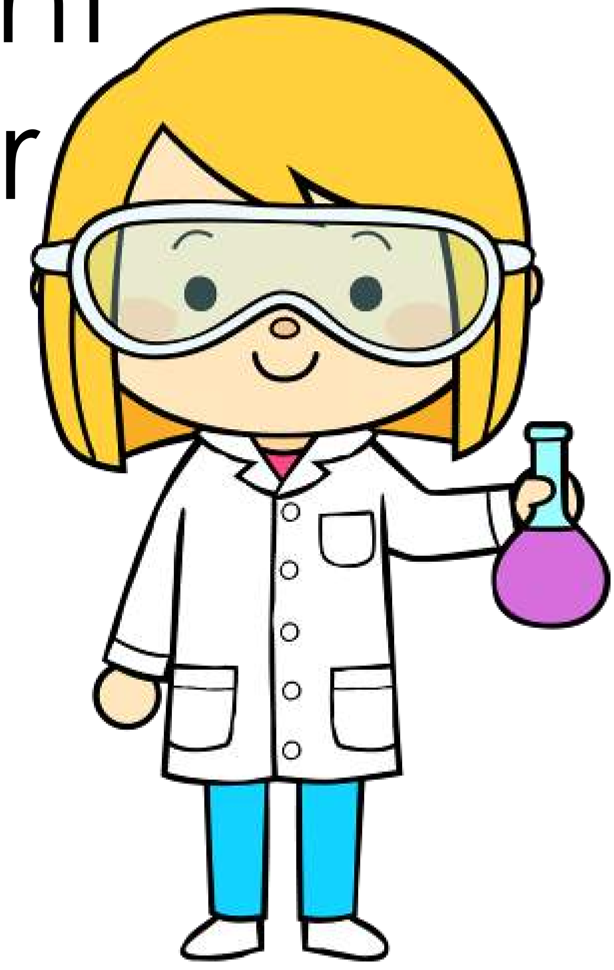
Gather information about what you want to learn.

Make a Hypothesis

Try to predict the answer! A hypotheses sounds like an *If I do this, then this will happen*. This being your experiment and outcome.

Set Up An Experiment

Design a test or experiment to see if your hypothesis is correct!



Record Data

Record what happens during the test or experiment.

Conclusions

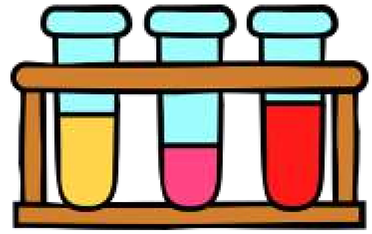
Analyze or review your data to see if your hypothesis was correct!

SCIENTIFIC METHOD

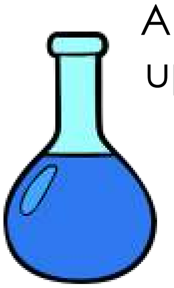
A method or procedure that uses an organized approach to solving a problem or answering a question through the use of a hypothesis, experimentation, observation, and data analysis.

HYPOTHESIS

An educated guess or simple explanation made as a starting point for further investigation or experimentation.



EXPERIMENT



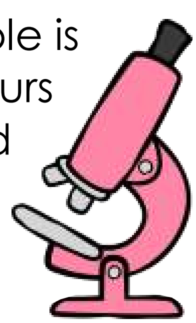
A scientific procedure set up to test a hypothesis or make a discovery. It usually involves a dependent variable, independent variable, and a control. The outcome is not necessarily known.

INDEPENDENT VARIABLE

The independent variable is the part of your experiment that you want to test.

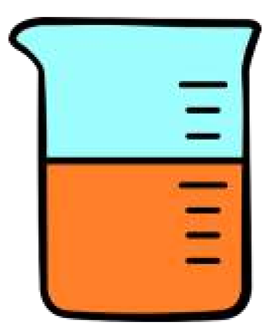
DEPENDENT VARIABLE

The dependent variable is the outcome that occurs in your experiment and a response to the changing independent variable.



CONTROL

The control is the neither the independent nor the dependent variable. The control is what you will compare the results in your experiment.



My Science Investigation

My Question

My Hypothesis

Research Notes

Supplies

Experiment

Observations

draw or write

Conclusions

My Science Investigation

My Question

Hypothesis

What is the Control?

Supplies Needed

What is the Dependent Variable?

Experiment

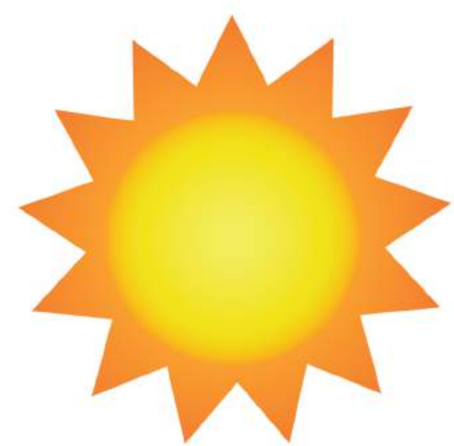
What is the Independent Variable?

Observations

Conclusions

Graphics provided by LittleRedsTreehouse.com

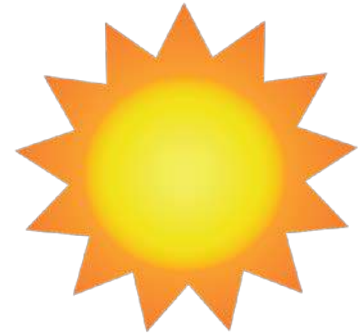
PRINTABLE RAINBOW ALGORITHM CODING GAME FOR KIDS

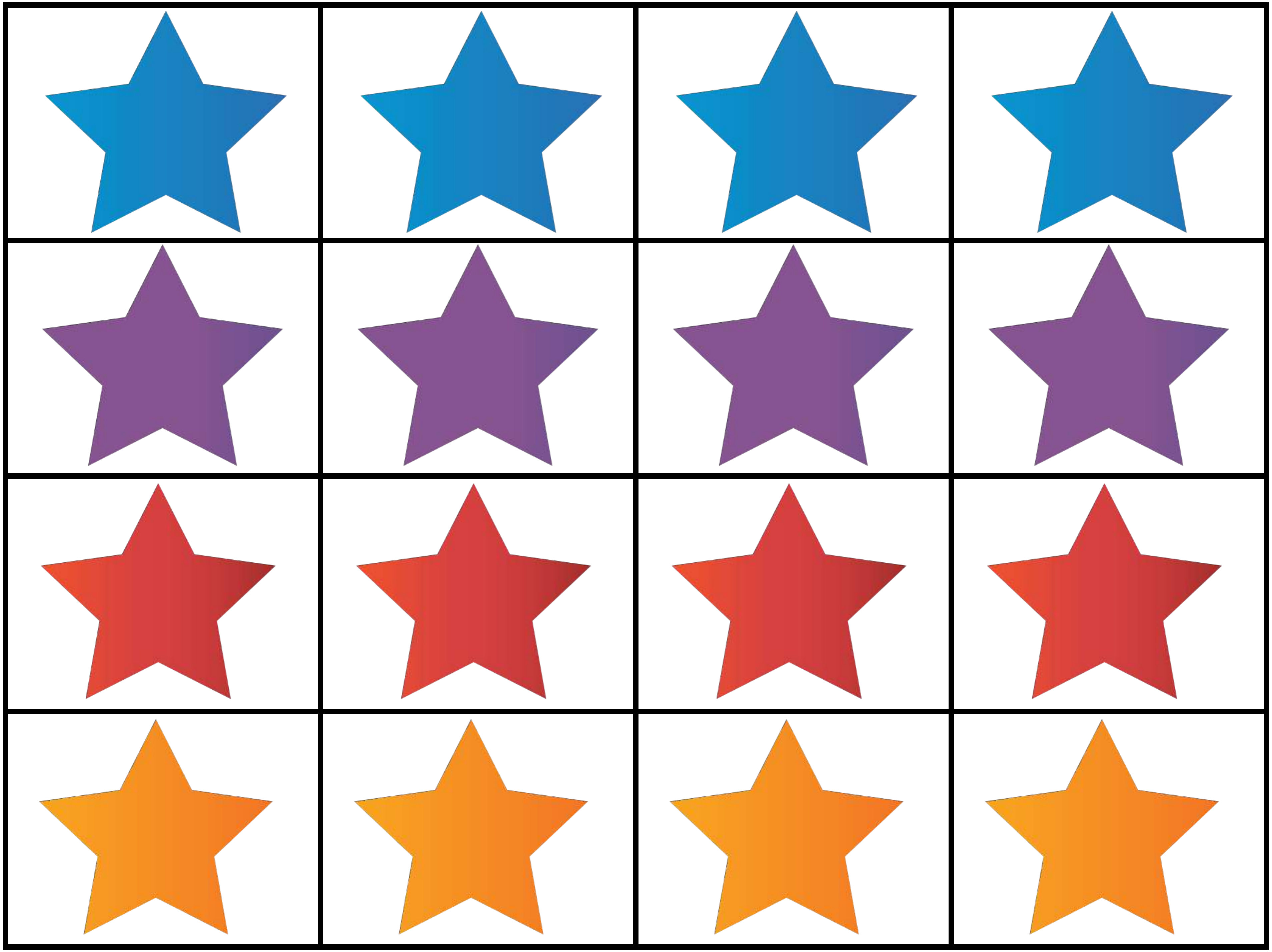


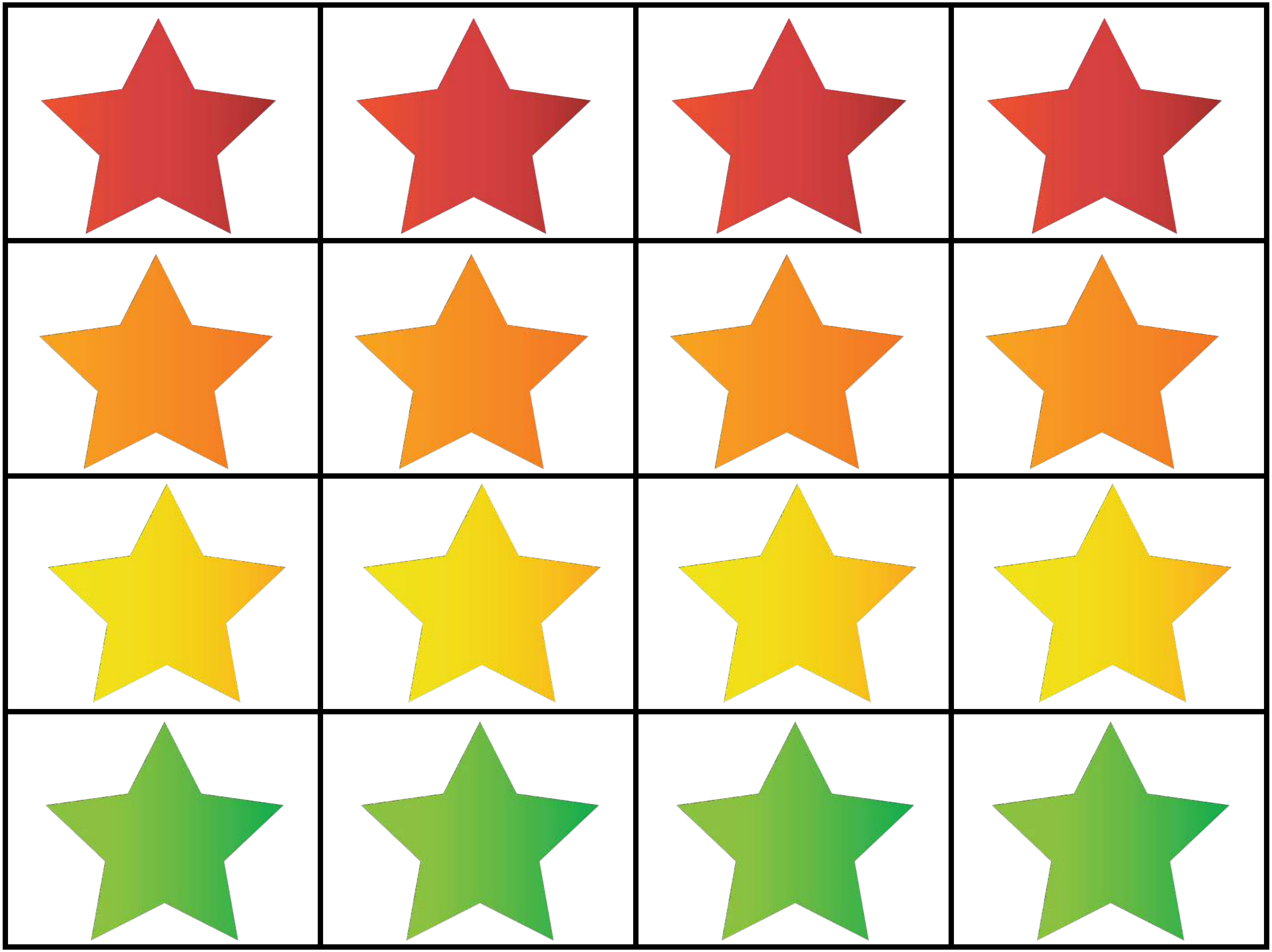
3 LEVELS OF DIFFICULTY

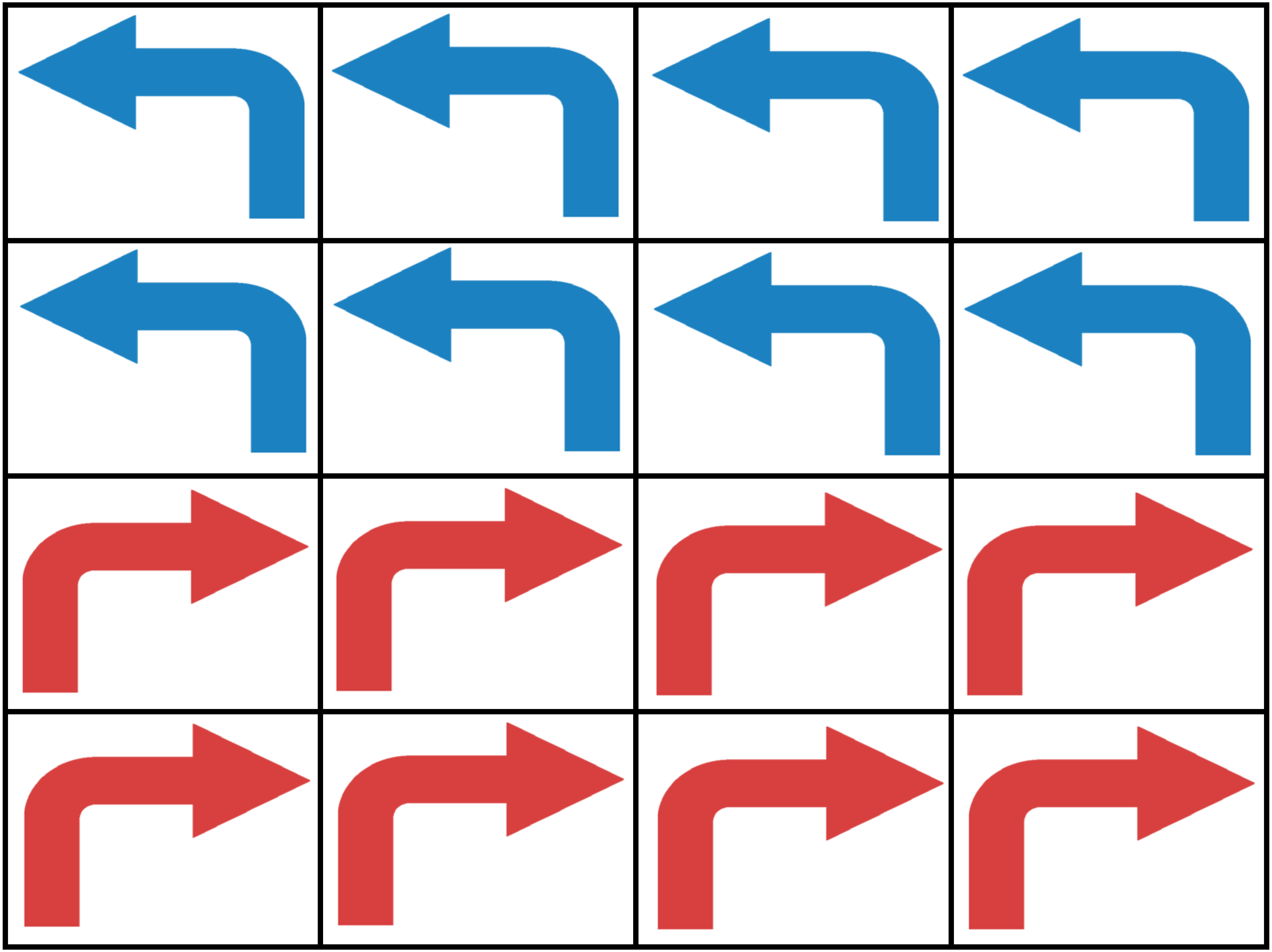
LITTLE BINS FOR LITTLE HANDS

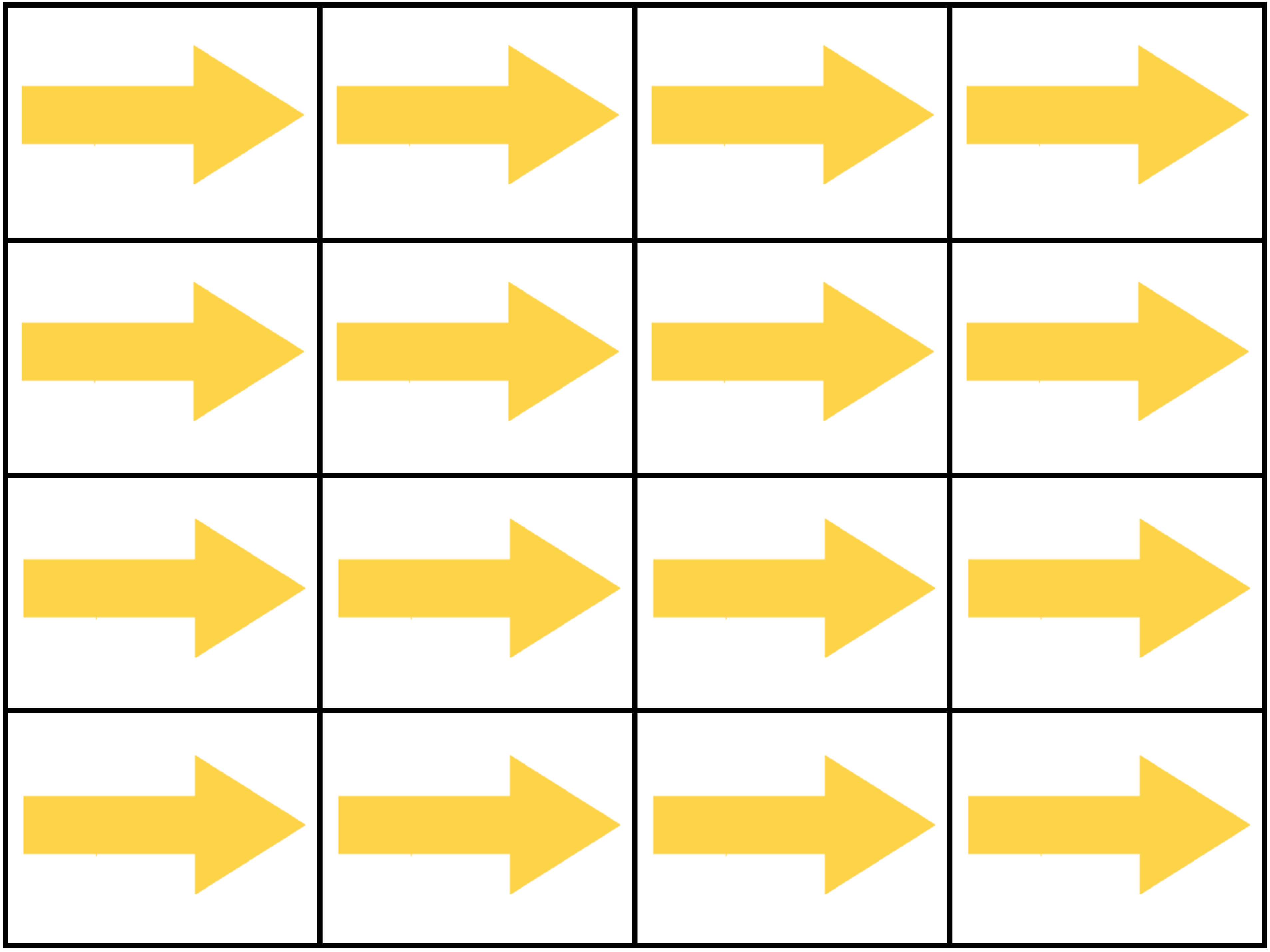
			

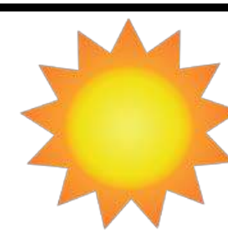
			



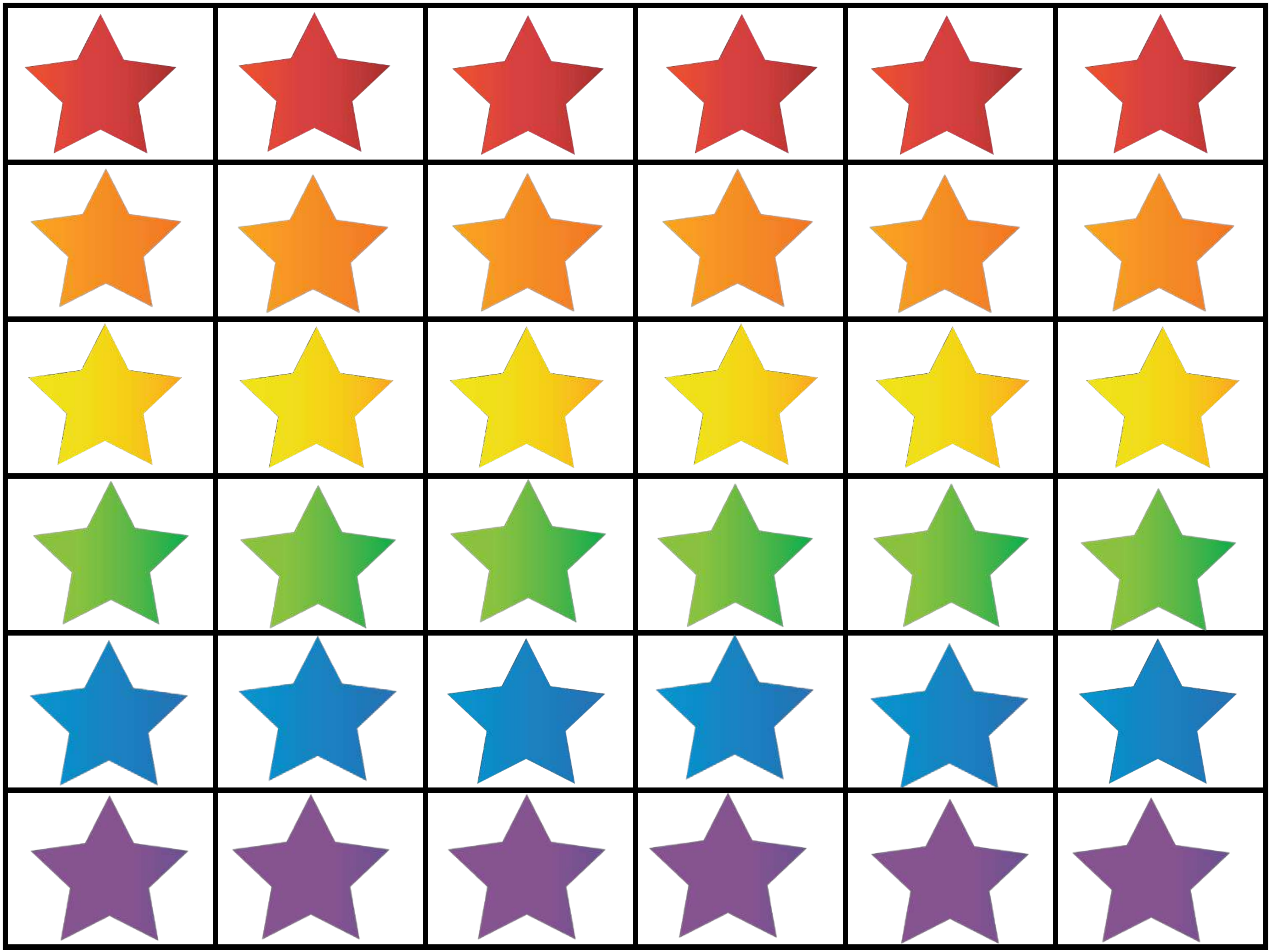


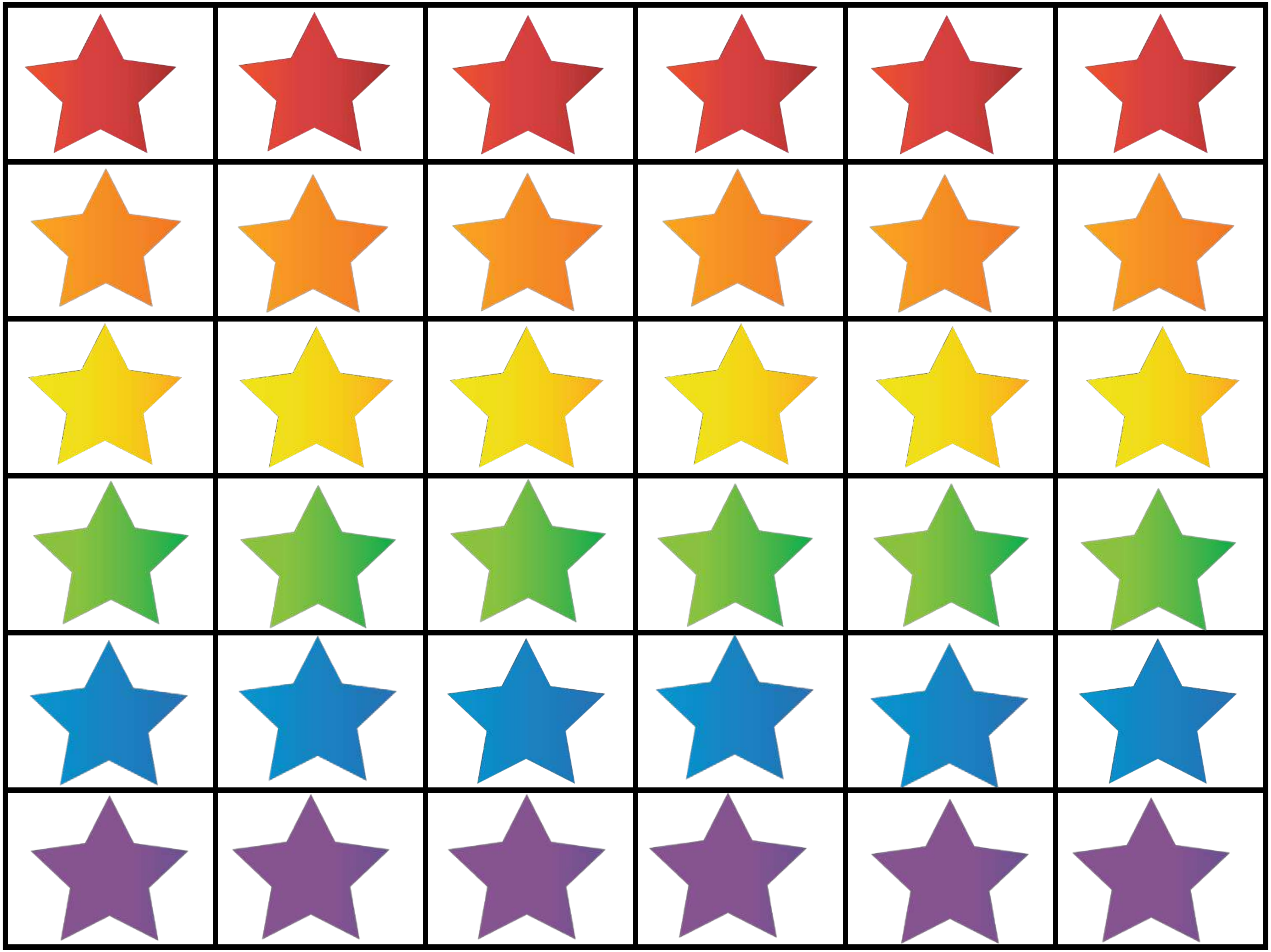


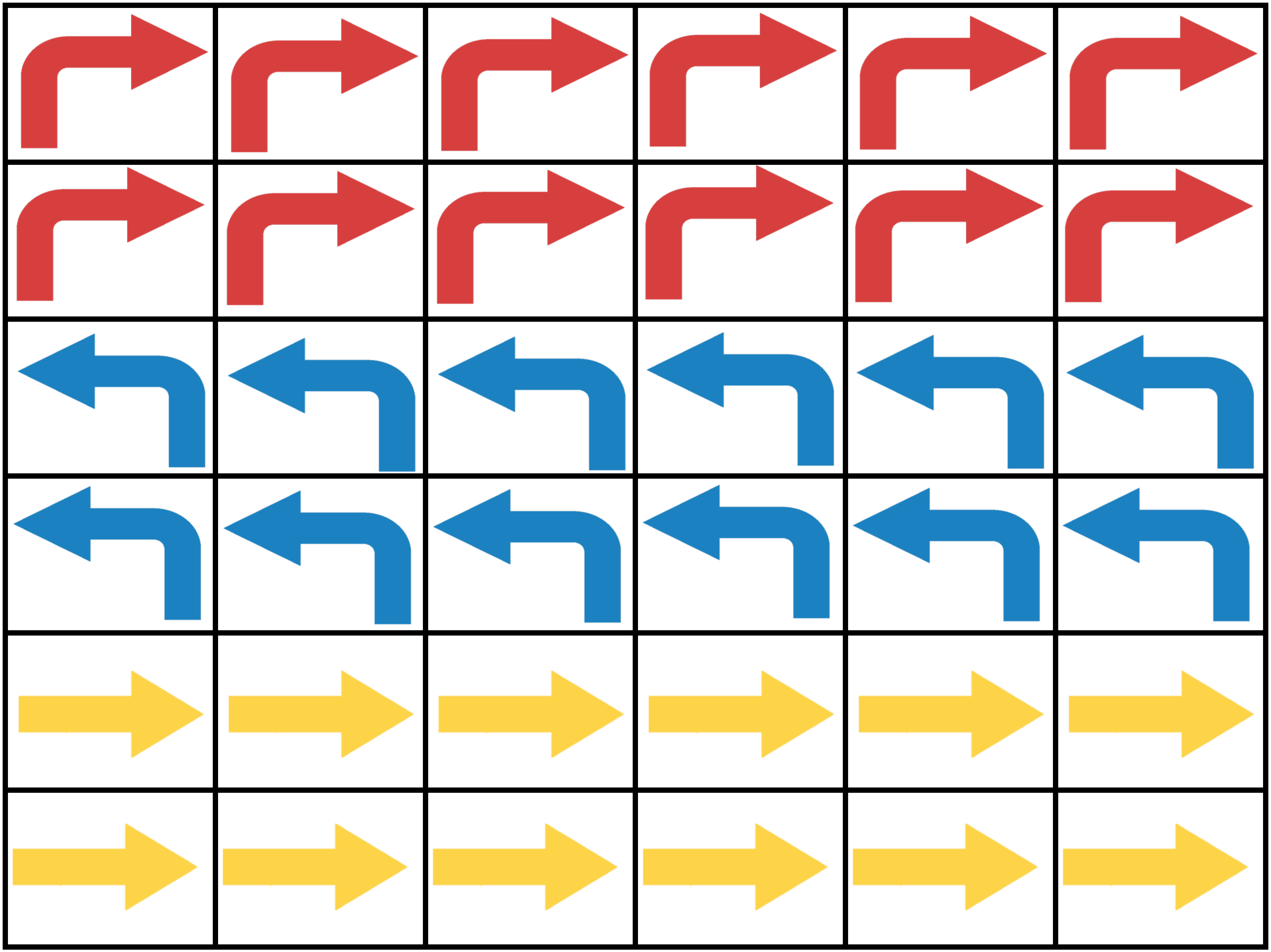


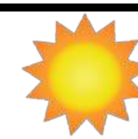
					

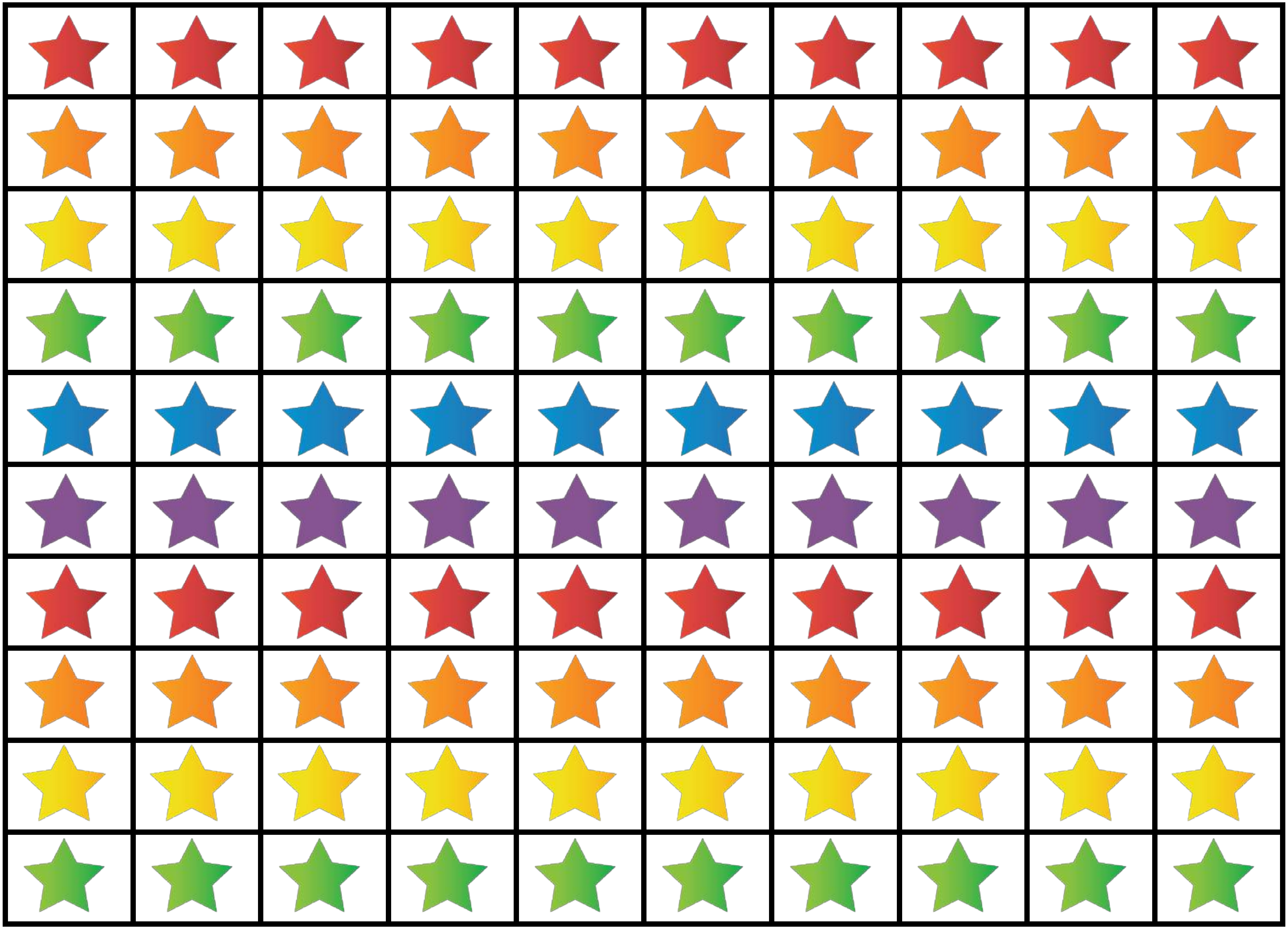
					

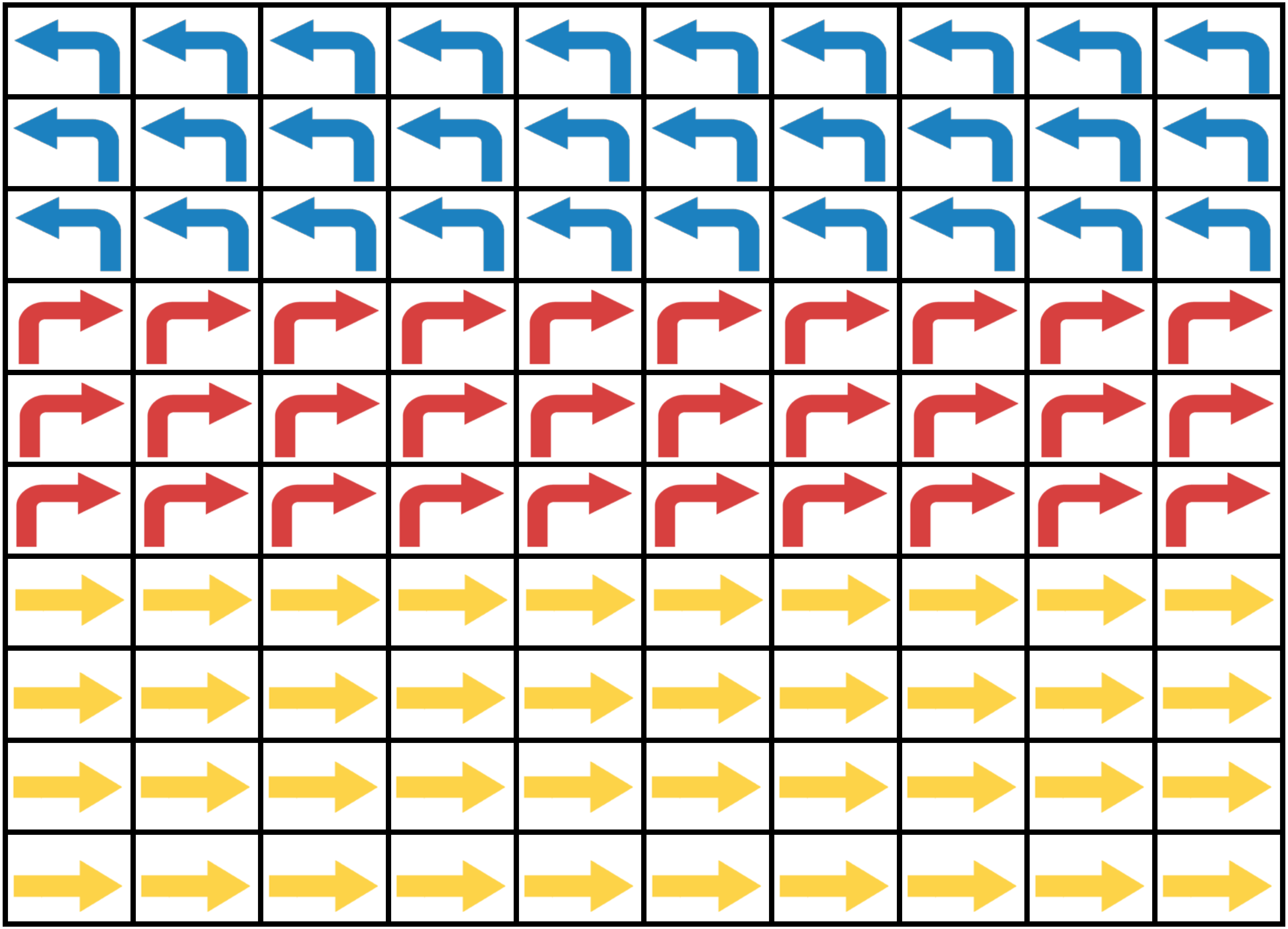










BINARY CODE

Coding ornaments are the perfect craft activity for the kid who doesn't care too much for crafts! Screen-free coding and ornament making as you explore the binary code.

SUPPLIES

- 3 Colors of Beads
- Pipe Cleaners
- Printable Binary Code Sheet

Choose one color bead for the number 1 and another color bead for the number 0. Choose a 3rd color bead to use as a spacer between letters.

Bend your pipe cleaner into a rainbow shape.

Choose a word or your name to be represented with the binary code. Use the printable sheet to write down the code.

If your word is too long for one pipe cleaner, simply attach another! Use ribbon or another type of fastener to hang in your window or tune into a keychain!

The computer doesn't read the letter A like we read the letter A. It reads it in a series of 1's and 0's. Each letter has its own code of 1's and 0's. This code is called the ASCII Binary Alphabet.

The binary number system is a base-2 number system. This means it only has two numbers: 0 and 1. The number system that we normally use is the decimal number system. It has 10 numbers: 0-9.

Computers work best with an “on” and “off” system and that is just what the binary code is all about. 1 is “on” and 0 is “off”.

ALPHABET IN BINARY CODE

A	01000001	J	01001010	S	01010011
B	01000010	K	01001011	T	01010100
C	01000011	L	01001100	U	01010101
D	01000100	M	01001101	V	01010110
E	01000101	N	01001110	W	01010111
F	01000110	O	01001111	X	01011000
G	01000111	P	01010000	Y	01011001
H	01001000	Q	01010001	Z	01011010
I	01001001	R	01010010		

WRITE YOUR NAME IN CODE

WRITE RED IN BINARY CODE

WRITE PURPLE IN BINARY CODE

WRITE ORANGE IN BINARY CODE

WRITE BLUE IN BINARY CODE

WRITE YELLOW IN BINARY CODE

WRITE GREEN IN BINARY CODE

RAINBOW SUDOKU

					9	5	1	3
5		7					9	
		8			3			7
	2	5						
3			4	5	2	8		
	8			7	1	3		
								9
		6			8			
	5	9						2

RAINBOW SUDOKU

4	6			8	9			
				1				8
		2				5	6	
7	4					3	9	
					4			
	8	9	2	6			1	
	5		7		8			3
			4				2	
				9	6			

1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9

SOLUTIONS

4	6	2	7	8	9	5	1	3
5	3	7	6	1	4	2	9	8
9	1	8	5	2	3	4	6	7
7	2	5	8	3	6	9	4	1
3	9	1	4	5	2	8	7	6
6	8	4	9	7	1	3	2	5
1	4	3	2	6	5	7	8	9
2	7	6	3	9	8	1	5	4
8	5	9	1	4	7	6	3	2

4	6	7	5	8	9	2	3	1
3	9	5	6	1	2	4	7	8
8	1	2	3	4	7	5	6	9
7	4	6	8	5	1	3	9	2
1	2	3	9	7	4	6	8	5
5	8	9	2	6	3	7	1	4
6	5	1	7	2	8	9	4	3
9	7	8	4	3	5	1	2	6
2	3	4	1	9	6	8	5	7

GRAPHICS CREDIT

RAINBOW BRICK CHALLENGES

RAINBOW STAR

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow star.

RAINBOW HEART

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow heart.

RAINBOW RABBIT

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow rabbit.

RAINBOW FLOWER

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow flower.

RAINBOW HOUSE

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow house.

RAINBOW SNAIL

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow snail.

RAINBOW BRICK CHALLENGES

RAINBOW KITE

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow kite.

RAINBOW BUG

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow bug.

RAINBOW UMBRELLA

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow umbrella.

RAINBOW

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow.

RAINBOW NEST

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow nest.

RAINBOW MAZE

Using red, orange, yellow, green, blue, and purple bricks, build a rainbow maze.

5+8	6+6	3+10	9+3	1+11	9+3	1+11	2+10	1+1	1+1	0+2	0+1	2+0	0+0	1+11	9+3	1+11	9+3	3+10	9+3	5+8	6+6
6+7	13+0	4+8	3+10	6+7	5+7	6+6	1+0	0+3	2+3	1+2	1+4	4+0	1+3	0+2	5+7	4+8	5+7	4+8	3+10	6+7	13+0
1+12	1+12	5+7	4+8	1+11	2+10	1+1	1+3	0+6	4+3	4+4	7+1	2+5	3+5	0+3	1+1	0+12	9+4	5+7	4+8	1+12	1+12
5+7	9+4	0+12	9+4	9+4	1+1	1+2	4+2	2+8	10+0	3+6	4+5	6+4	0+9	3+3	1+2	2+0	4+8	0+12	9+4	5+7	9+4
2+10	6+7	2+11	13+0	2+0	1+4	3+3	10+1	0+12	9+4	2+11	13+0	1+11	9+3	4+7	1+5	2+3	0+1	2+11	13+0	2+10	6+7
6+6	1+11	4+8	0+1	0+3	4+3	7+1	4+8	2+12	3+12	2+13	3+11	5+10	5+9	4+8	1+9	4+2	0+3	1+1	4+8	6+6	1+11
1+11	9+3	0+2	2+3	3+5	5+6	9+3	7+7	5+8	6+6	1+11	9+3	5+7	4+8	4+10	5+7	8+1	3+5	1+3	1+0	2+11	13+0
6+7	1+1	1+3	6+2	8+1	3+10	1+14	2+11	6+7	13+0	5+8	6+6	3+10	9+3	13+0	6+8	3+10	5+5	6+2	1+2	1+1	3+10
1+0	0+5	7+1	2+9	5+8	6+9	5+7	4+8	1+12	1+12	6+7	13+0	5+8	6+6	2+11	13+0	2+13	6+6	0+11	6+1	4+0	2+0
2+0	1+4	8+0	7+3	6+7	4+11	0+12	9+4	5+7	9+4	1+12	1+12	6+7	13+0	5+8	6+6	5+10	13+0	7+3	8+0	0+3	0+0
0+0	4+0	4+4	3+8	1+12	1+13	2+11	13+0	2+10	6+7	5+7	9+4	1+12	1+12	6+7	13+0	7+7	1+12	5+6	4+3	1+4	0+2
1+1	2+3	2+5	0+11	5+7	6+8	5+8	6+6	6+6	1+11	2+10	6+7	5+7	9+4	1+12	1+12	7+8	9+4	2+8	2+5	0+5	1+1
0+1	0+3	6+1	5+5	2+10	7+8	6+7	13+0	5+7	4+8	6+6	1+11	2+10	6+7	5+7	9+4	5+9	6+7	3+6	3+3	1+2	2+0
1+1	1+2	1+5	1+9	6+6	14+0	1+12	1+12	3+10	9+3	1+11	9+3	6+6	1+11	2+10	6+7	6+9	1+11	4+7	6+2	2+3	0+2
5+8	6+6	4+8	3+10	2+10	6+7	5+7	9+4	5+8	6+6	2+11	13+0	2+10	6+7	6+6	1+11	1+12	1+12	1+11	9+3	2+11	13+0
6+7	13+0	1+12	1+12	6+6	1+11	2+10	6+7	6+7	13+0	1+12	1+12	6+6	1+11	5+8	6+6	5+7	9+4	2+10	6+7	1+11	9+3
3+10	9+3	5+7	9+4	5+8	6+6	6+6	1+11	4+8	3+10	5+7	9+4	0+12	9+4	6+7	13+0	4+8	3+10	6+6	1+11	3+10	9+3

red	0, 1, 2
orange	3, 4, 5

yellow	6, 7, 8
green	9, 10, 11

blue	12, 13
purple	14, 15

5+8	6+6	3+10	9+3	1+11	9+3	1+11	2+10	1+1	1+1	0+2	0+1	2+0	0+0	1+11	9+3	1+11	9+3	3+10	9+3	5+8	6+6
6+7	13+0	4+8	3+10	6+7	5+7	6+6	1+0	0+3	2+3	1+2	1+4	4+0	1+3	0+2	5+7	4+8	5+7	4+8	3+10	6+7	13+0
1+12	1+12	5+7	4+8	1+11	2+10	1+1	1+3	0+6	4+3	4+4	7+1	2+5	3+5	0+3	1+1	0+12	9+4	5+7	4+8	1+12	1+12
5+7	9+4	0+12	9+4	9+4	1+1	1+2	4+2	2+8	10+0	3+6	4+5	6+4	0+9	3+3	1+2	2+0	4+8	0+12	9+4	5+7	9+4
2+10	6+7	2+11	13+0	2+0	1+4	3+3	10+1	0+12	9+4	2+11	13+0	1+11	9+3	4+7	1+5	2+3	0+1	2+11	13+0	2+10	6+7
6+6	1+11	4+8	0+1	0+3	4+3	7+1	4+8	2+12	3+12	2+13	3+11	5+10	5+9	4+8	1+9	4+2	0+3	1+1	4+8	6+6	1+11
1+11	9+3	0+2	2+3	3+5	5+6	9+3	7+7	5+8	6+6	1+11	9+3	5+7	4+8	4+10	5+7	8+1	3+5	1+3	1+0	2+11	13+0
6+7	1+1	1+3	6+2	8+1	3+10	1+14	2+11	6+7	13+0	5+8	6+6	3+10	9+3	13+0	6+8	3+10	5+5	6+2	1+2	1+1	3+10
1+0	0+5	7+1	2+9	5+8	6+9	5+7	4+8	1+12	1+12	6+7	13+0	5+8	6+6	2+11	13+0	2+13	6+6	0+11	6+1	4+0	2+0
2+0	1+4	8+0	7+3	6+7	4+11	0+12	9+4	5+7	9+4	1+12	1+12	6+7	13+0	5+8	6+6	5+10	13+0	7+3	8+0	0+3	0+0
0+0	4+0	4+4	3+8	1+12	1+13	2+11	13+0	2+10	6+7	5+7	9+4	1+12	1+12	6+7	13+0	7+7	1+12	5+6	4+3	1+4	0+2
1+1	2+3	2+5	0+11	5+7	6+8	5+8	6+6	6+6	1+11	2+10	6+7	5+7	9+4	1+12	1+12	7+8	9+4	2+8	2+5	0+5	1+1
0+1	0+3	6+1	5+5	2+10	7+8	6+7	13+0	5+7	4+8	6+6	1+11	2+10	6+7	5+7	9+4	5+9	6+7	3+6	3+3	1+2	2+0
1+1	1+2	1+5	1+9	6+6	14+0	1+12	1+12	3+10	9+3	1+11	9+3	6+6	1+11	2+10	6+7	6+9	1+11	4+7	6+2	2+3	0+2
5+8	6+6	4+8	3+10	2+10	6+7	5+7	9+4	5+8	6+6	2+11	13+0	2+10	6+7	6+6	1+11	1+12	1+12	1+11	9+3	2+11	13+0
6+7	13+0	1+12	1+12	6+6	1+11	2+10	6+7	6+7	13+0	1+12	1+12	6+6	1+11	5+8	6+6	5+7	9+4	2+10	6+7	1+11	9+3
3+10	9+3	5+7	9+4	5+8	6+6	6+6	1+11	4+8	3+10	5+7	9+4	0+12	9+4	6+7	13+0	4+8	3+10	6+6	1+11	3+10	9+3

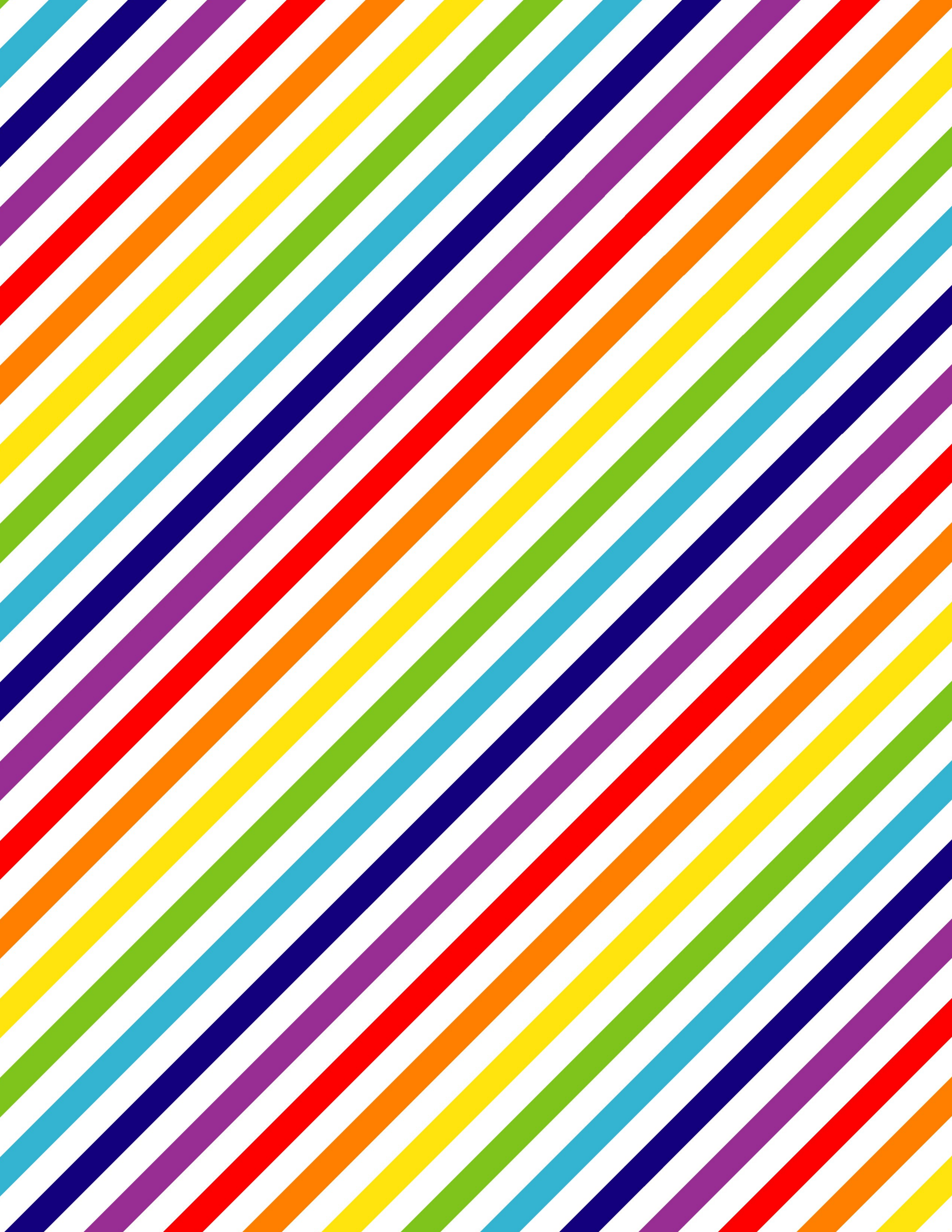
red	0, 1, 2
orange	3, 4, 5

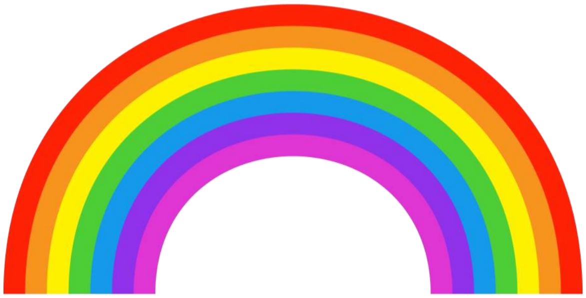
yellow	6, 7, 8
green	9, 10, 11

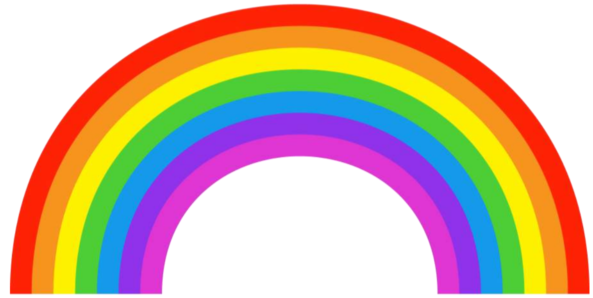
blue	12, 13
purple	14, 15

Rainbow Match Game

Graphics by Keepin It Kawaii







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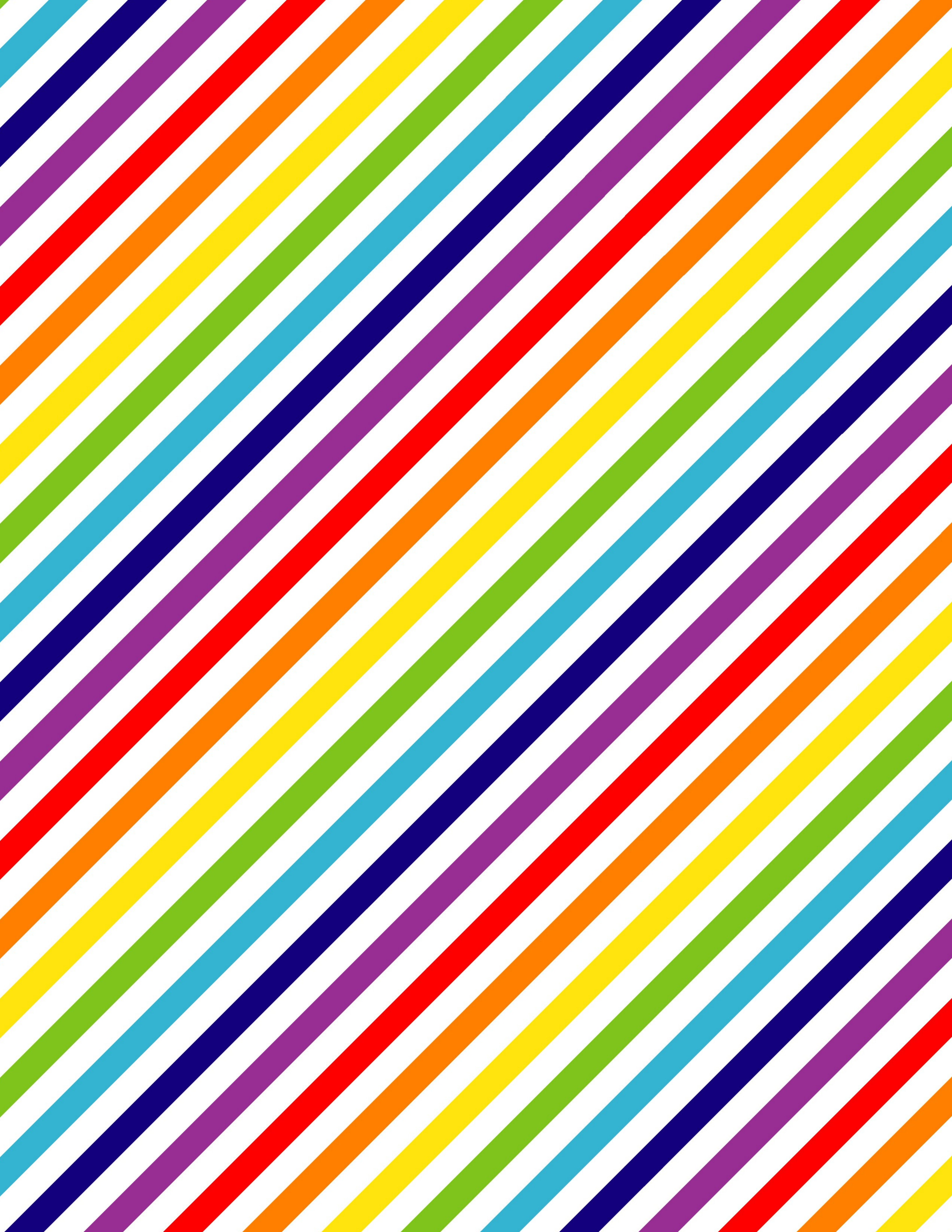
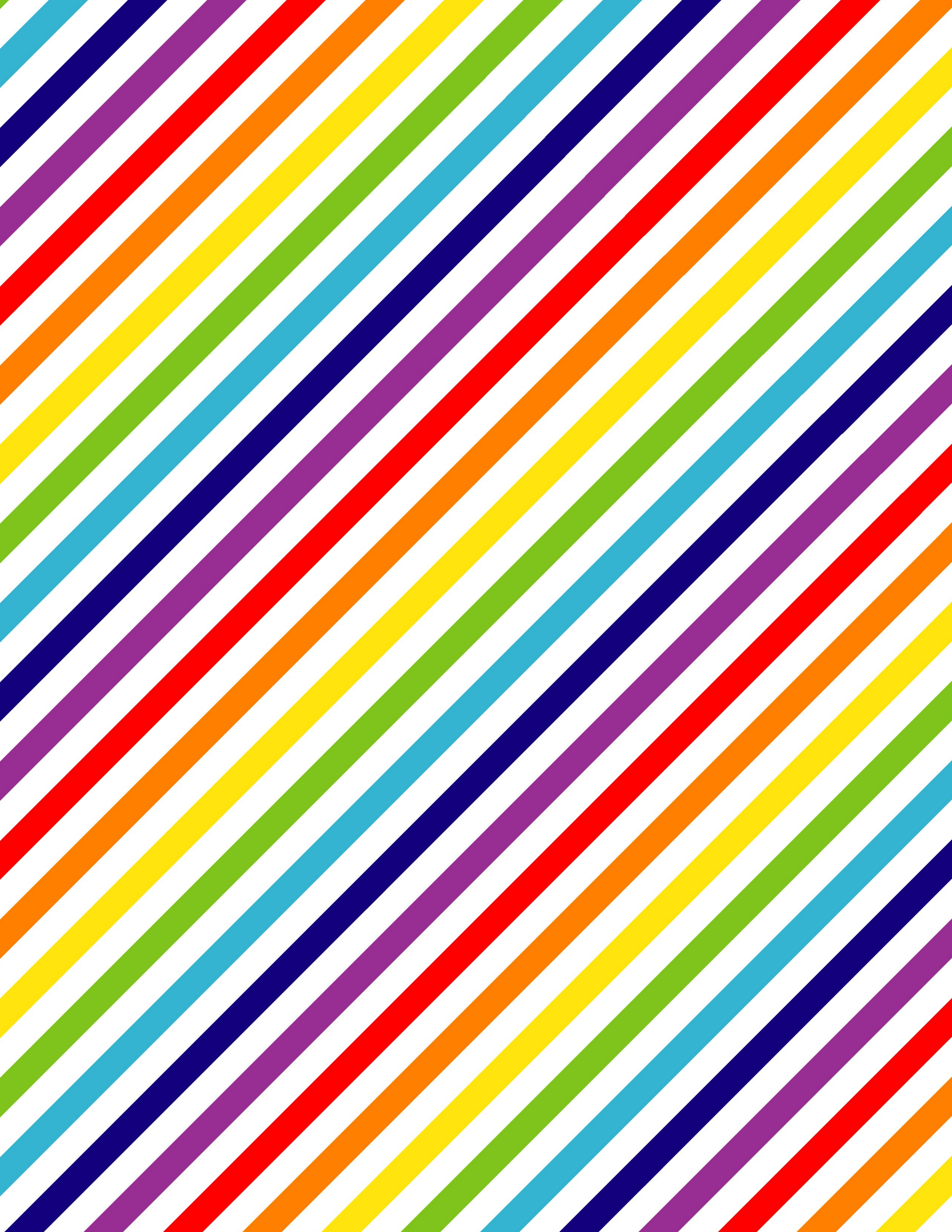
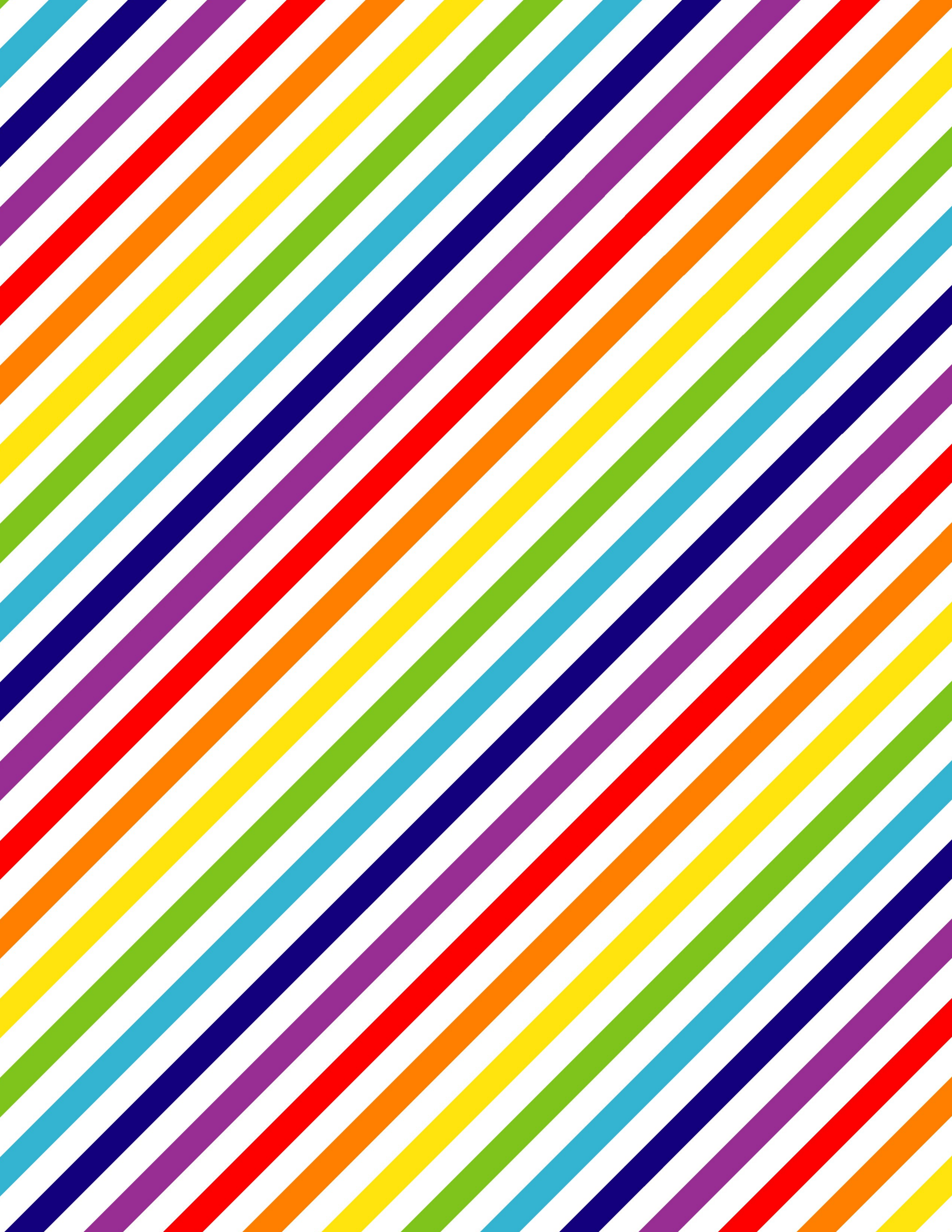
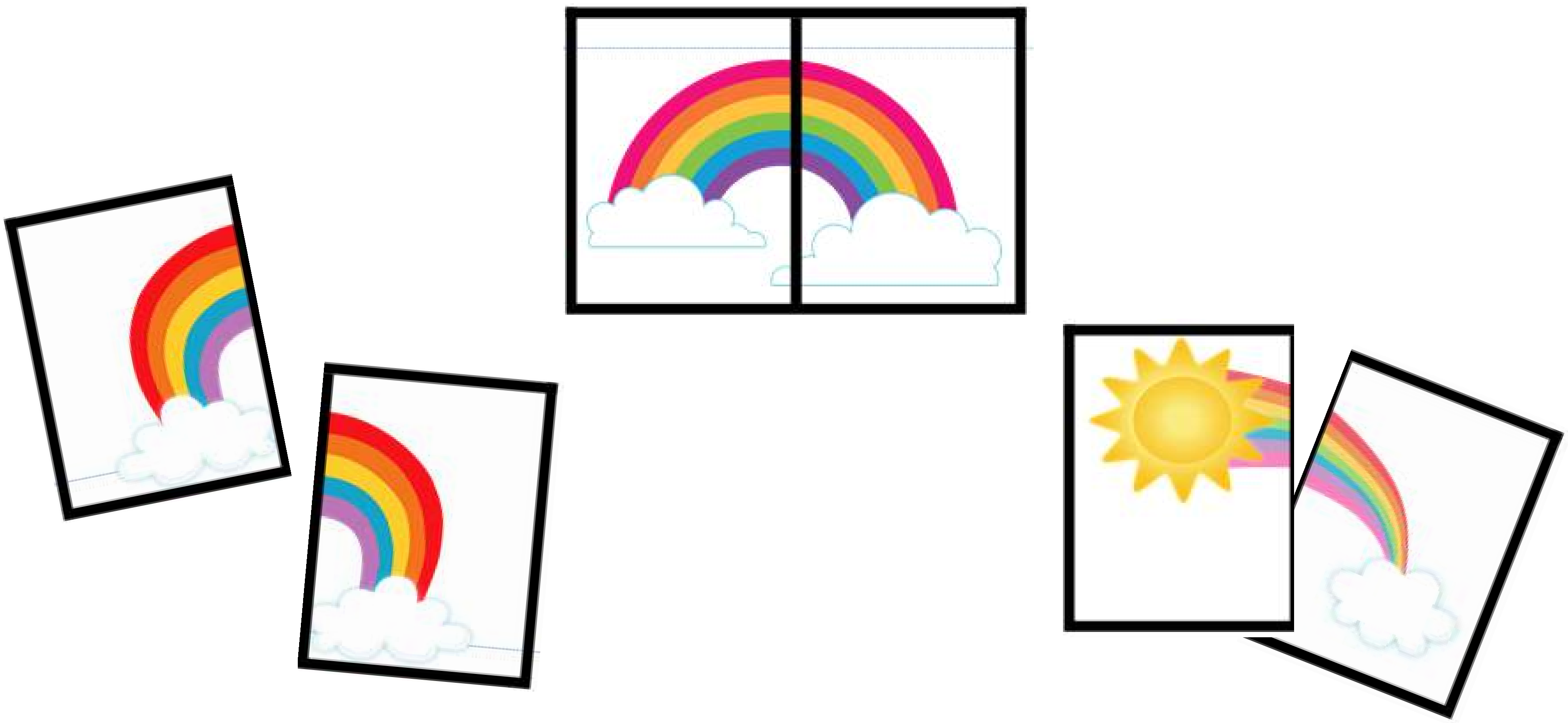






MATCH THE RAINBOWS
PUZZLE GAME



LITTLE BINS FOR LITTLE HANDS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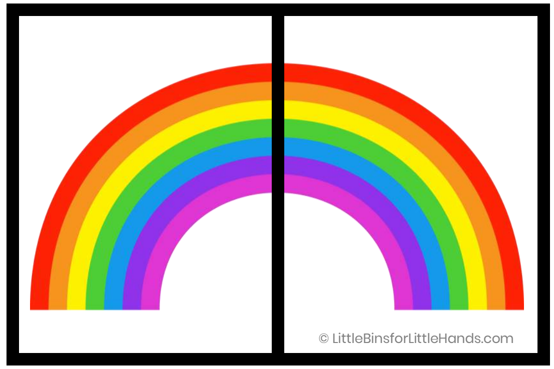
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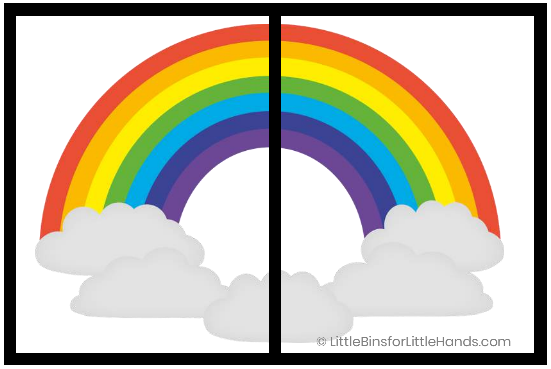
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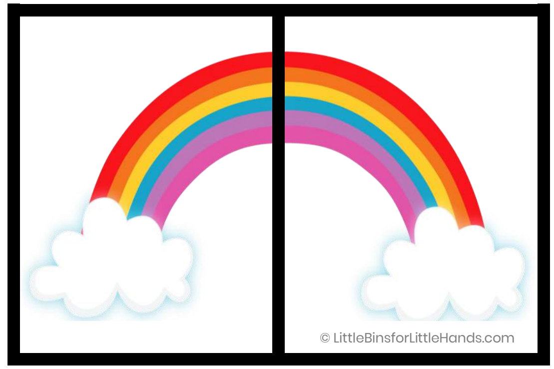
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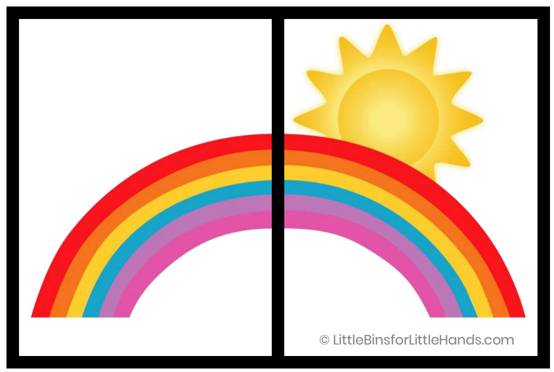
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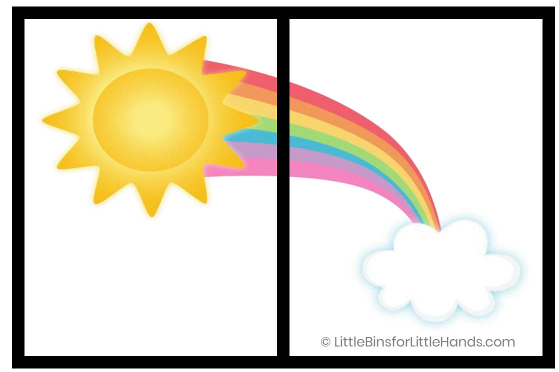
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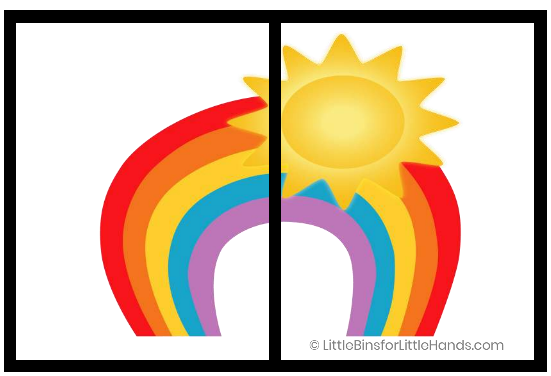
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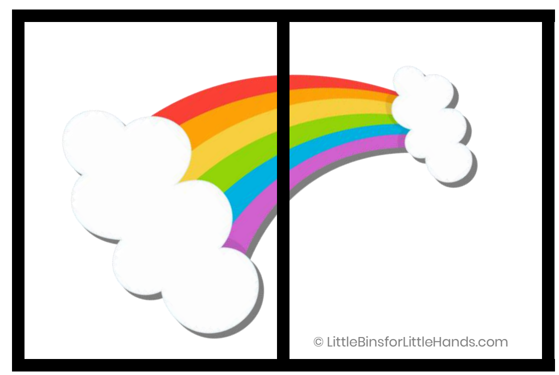
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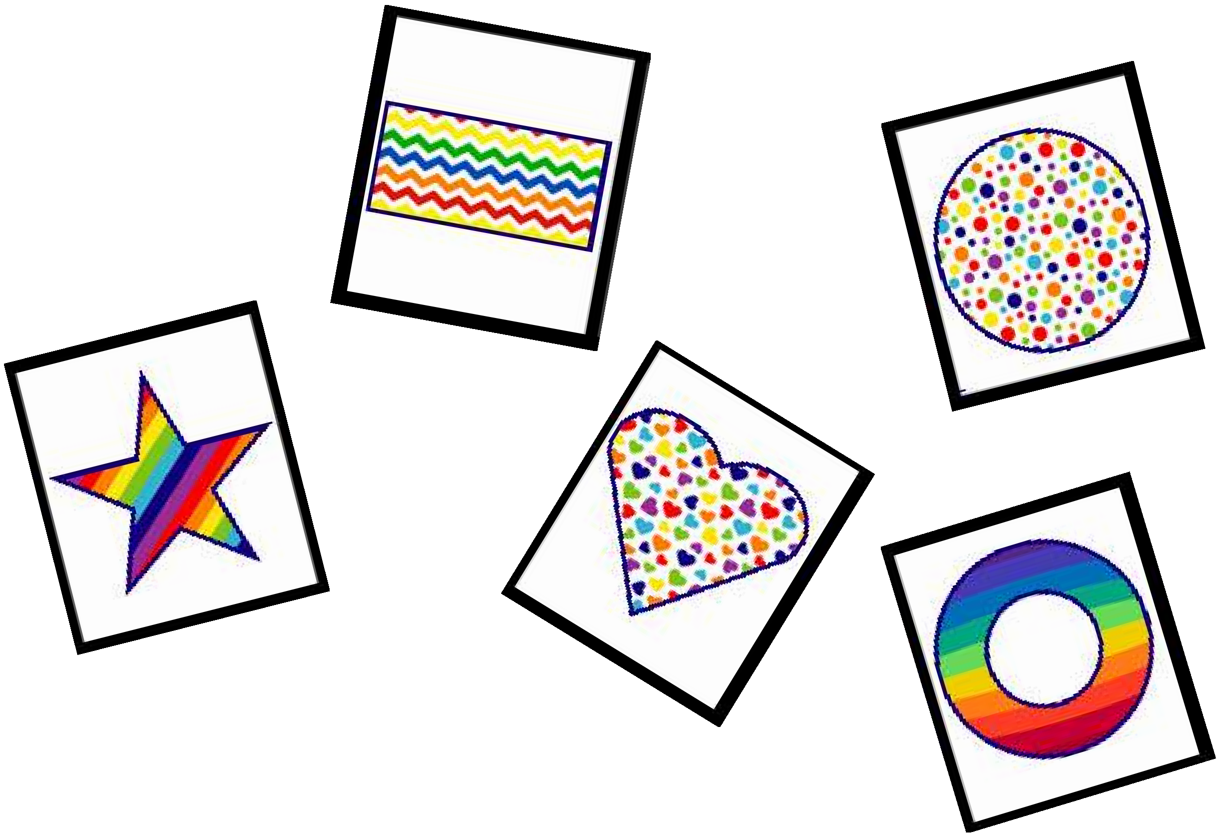

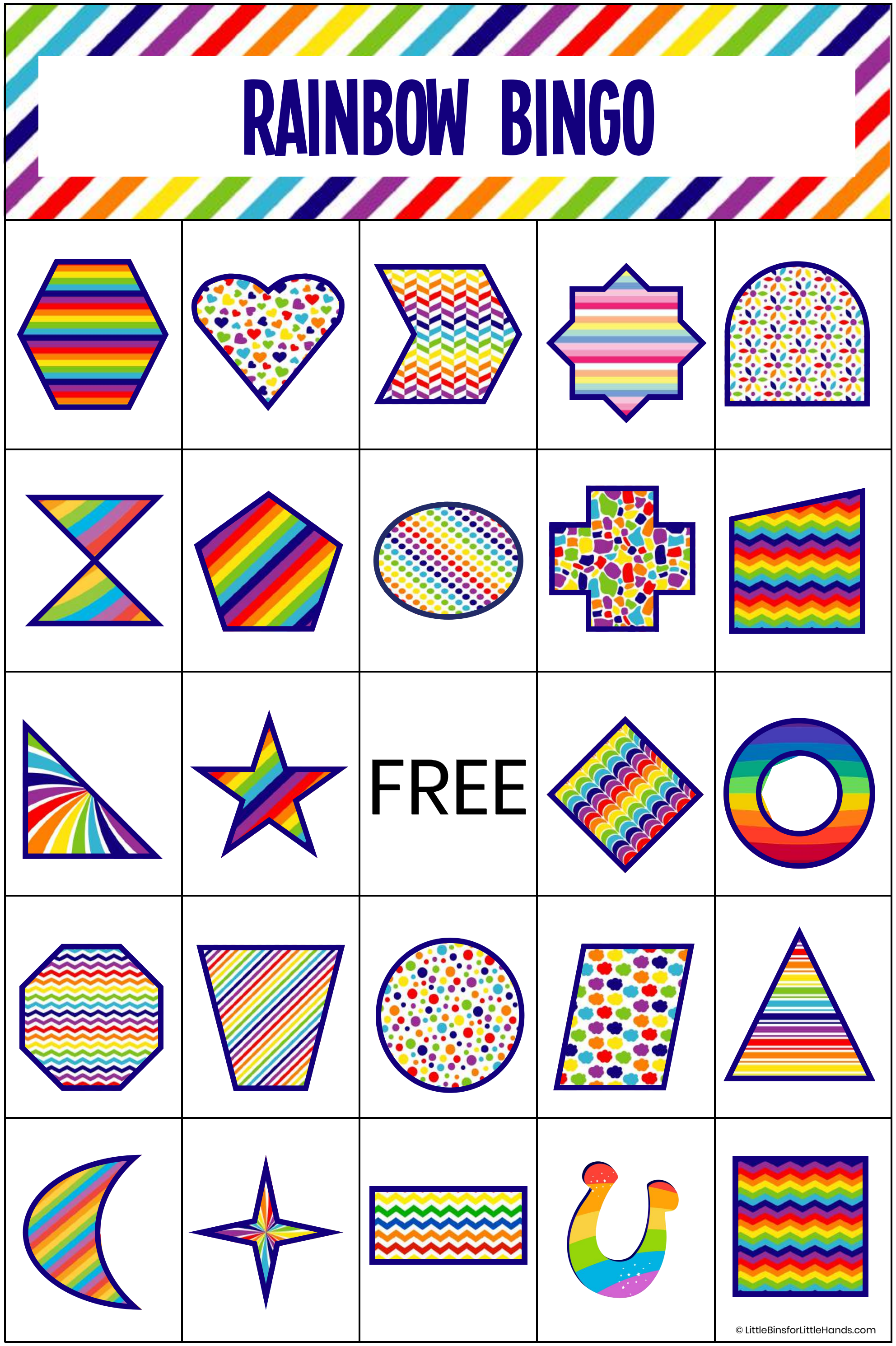
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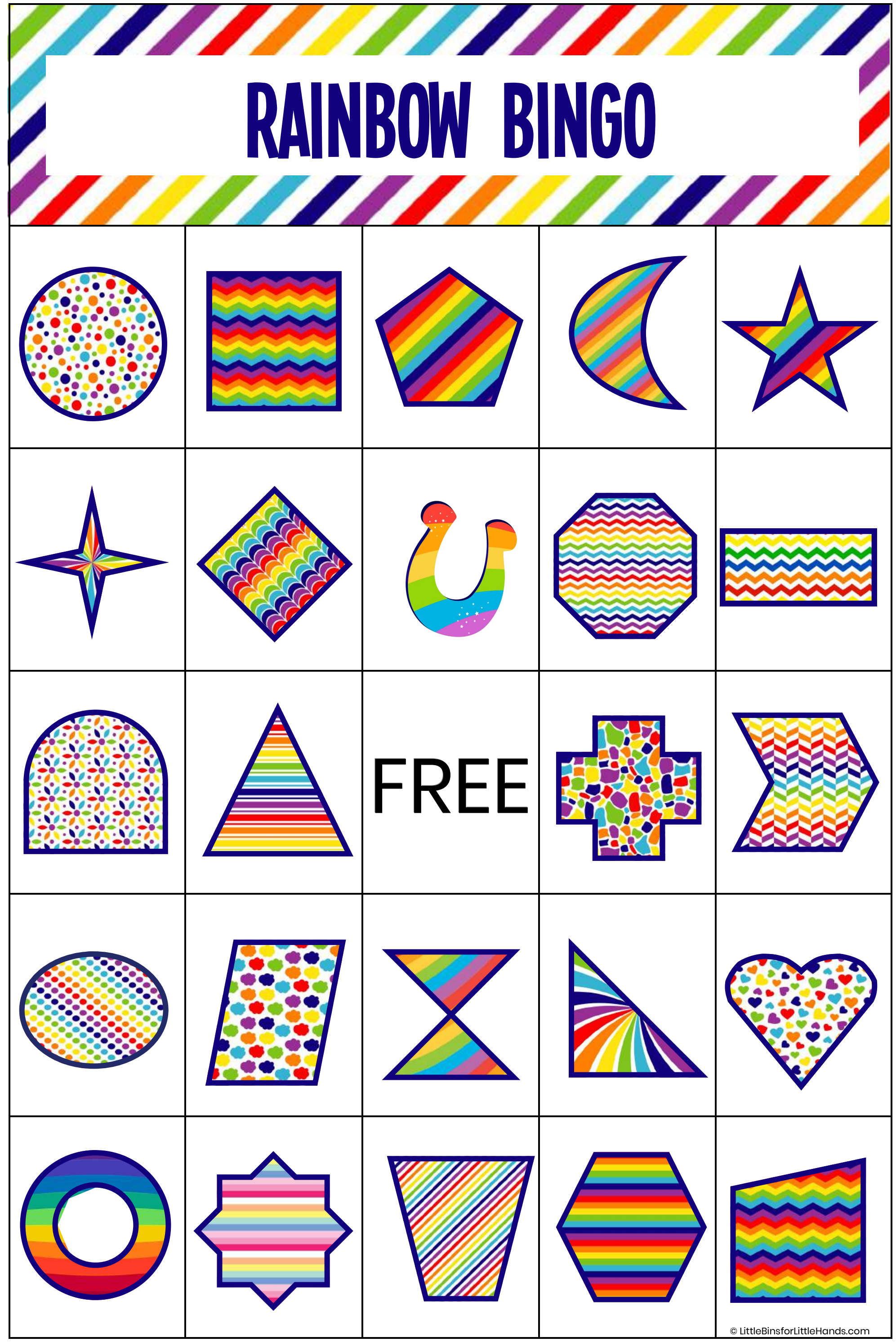
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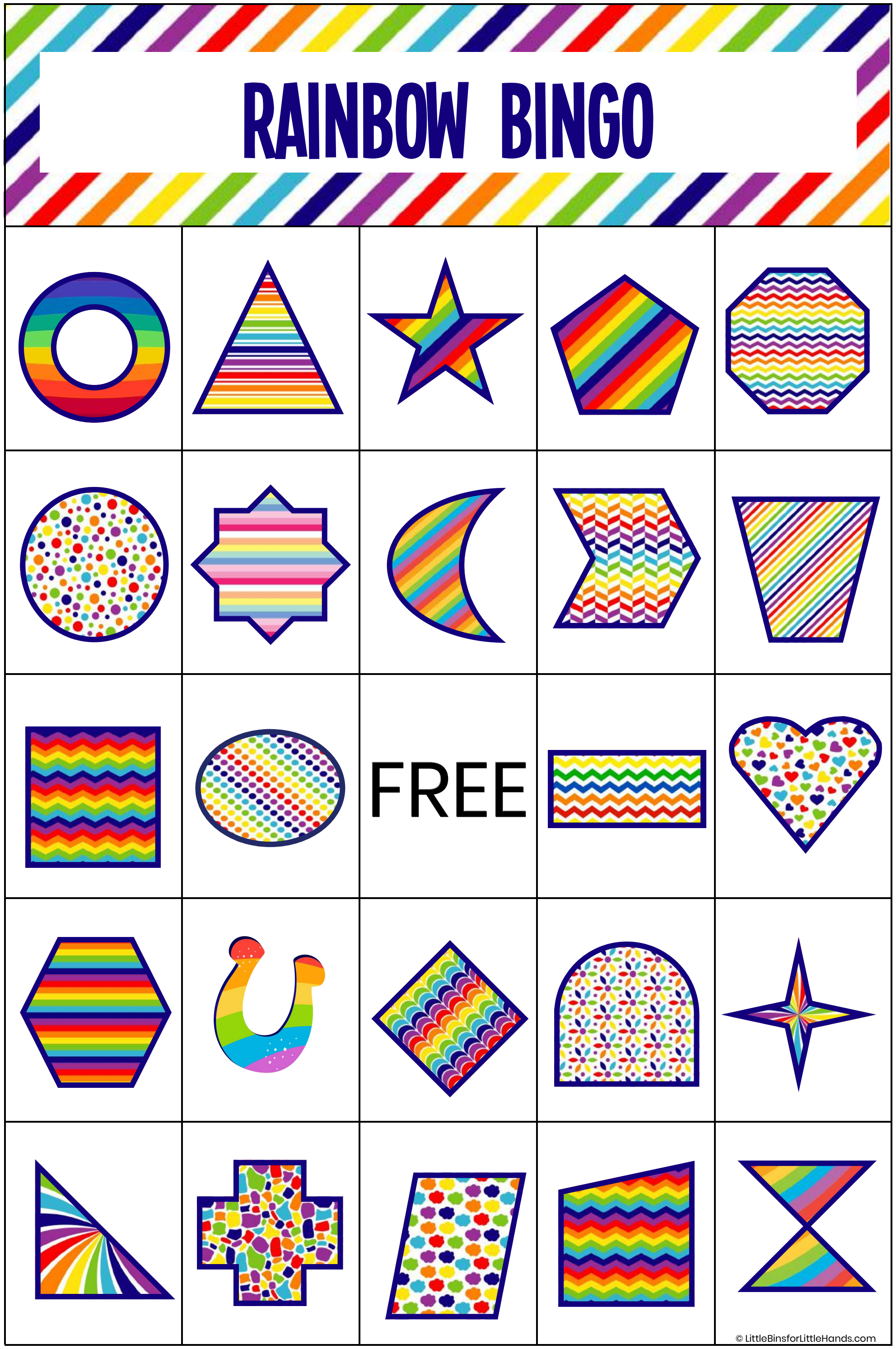
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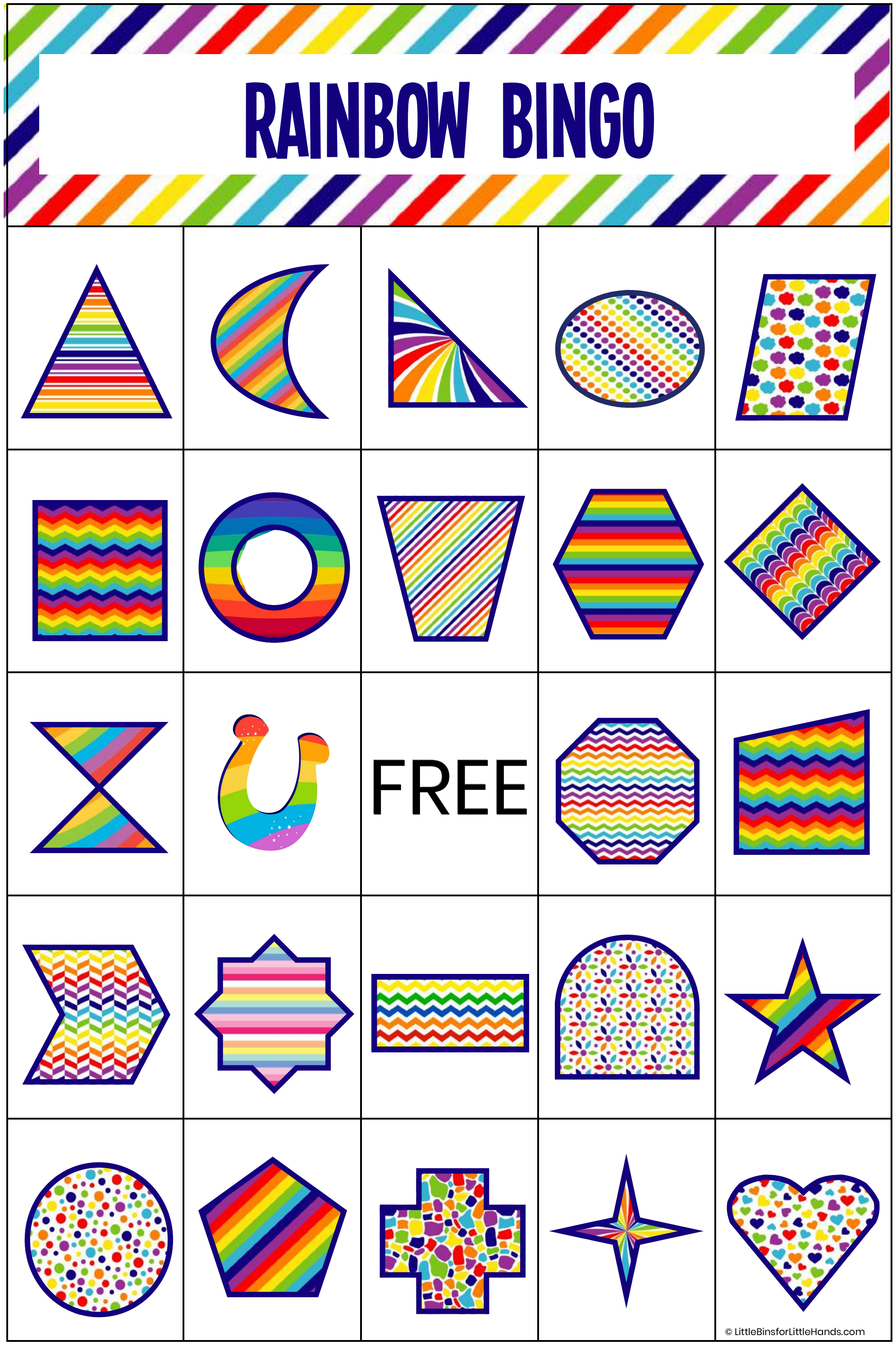
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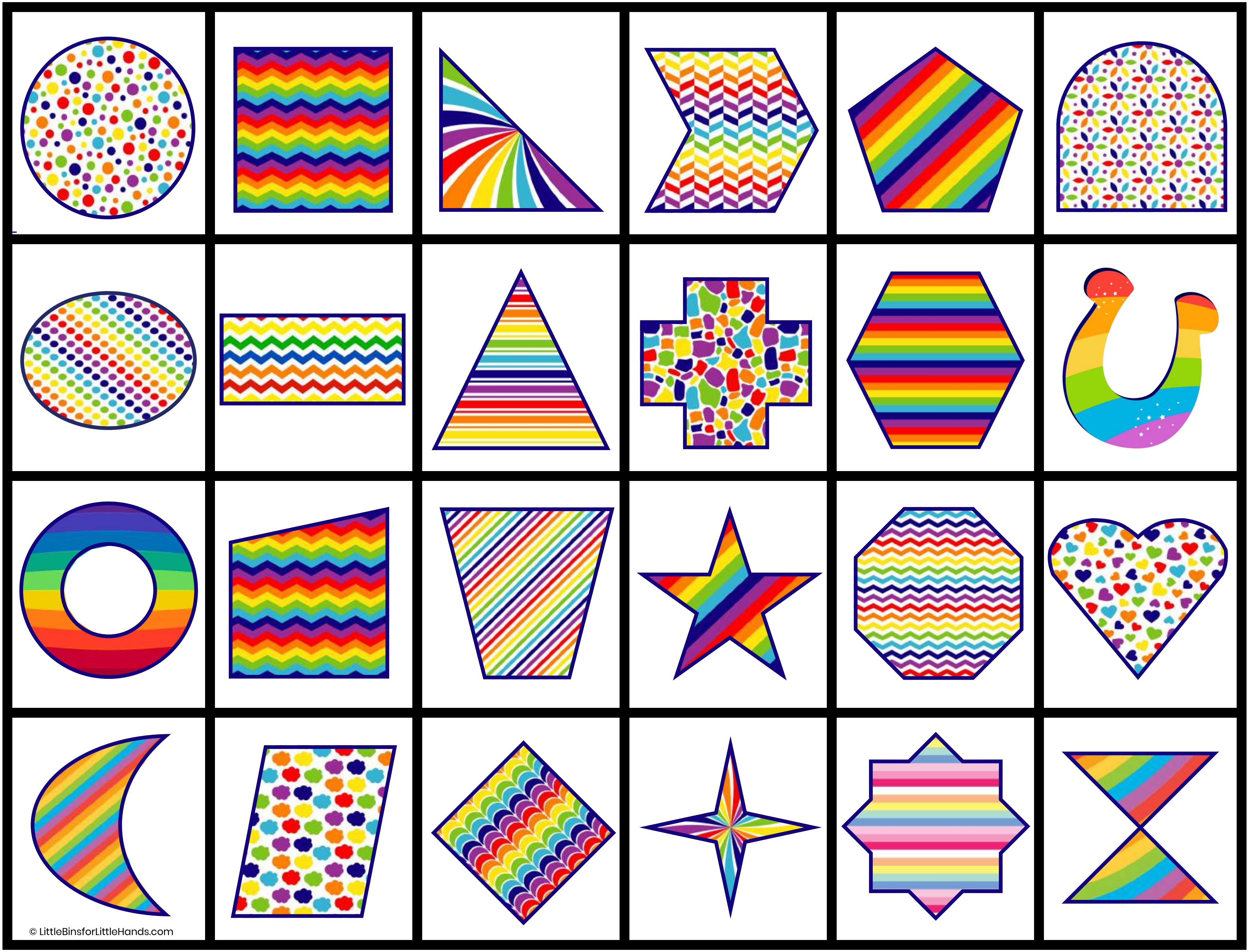

Find a Rainbow Scavenger Hunt

Can you find something for every color of the rainbow?

Red ______________________

Orange ______________________

Yellow ______________________

Green ______________________

Blue ______________________

Indigo ______________________

Violet ______________________

RAINBOW I SPY

RAINBOW I SPY