



The Math and Art Connection



HONEYCOMB HEXAGONS



Welcome to The Math and Art Connection!

Did you know that math and art are like best friends who love to work together? It's true! Artists use math to create amazing artworks, and you're going to learn how to do the same.

Math helps artists make sure everything looks just right. Whether it's drawing shapes that are symmetrical, figuring out proportions to make things look just right, or using patterns to make their artwork pop. Math is everywhere in art!

In Art Makes Me Smart – The Math and Art Connection, we are going to be doing some art together that will spark curiosity about mathematics. At the same time we will see that math is a powerful tool to help our art skills grow. As we explore the connection between art and math, we will see that math is truly full of beauty and beauty is full of math!

Through this project, you'll see first hand the math and art connection while creating a beautiful piece of artwork to enjoy.

One last thing! You are invited to [join the Art Makes Me Smart private Facebook group](#) where we share what we're making and learning. Don't be shy! It would mean so much to have you join in and share what you are doing.

Remember, **Art Makes You SMART!**

Your friends,



Hannah Stevenson
Founder



Alyson Harwood
Teacher



A Note for Parents

Welcome, parents! We are excited to share with you our latest course in Art Makes Me Smart. This packet is designed to make learning about the math both fun and engaging through a variety of activities and resources.

We hope this packet serves as a springboard for exciting explorations, thoughtful conversations, and cherished bonding moments between you and your children.

Each packet includes the following:

- **Project Supply Lists** - This list includes all the materials your child will need to complete our special art project.
- **Step-by-Step video lessons** are in our [digital course here](#)
- **Keywords and Definitions** - To reinforce learning, we've provided a glossary of key terms and definitions from the lesson.
- **Educational facts** to deepen the connection between math and art
- **Video Resources** - To extend your child's learning, we have compiled a list of video resources that explain the mathematical concepts in various engaging formats.
- **Additional Activities** - For further practice, we have included additional activities. These activities range from simple calculations to more complex projects, ensuring that your child can continue to build their skills at home.
- **Discussion Questions** - To help you engage with your child's learning, we have prepared a list of discussion questions you can use to spark meaningful conversations. These questions will encourage your child to think critically and explain their understanding in their own words.

We recommend starting with the supply list to ensure you have everything needed for the project. You'll find the video step-by-step lessons in the digital course as well as activities provided for younger children that pairs with the same mathematical concept.

Explore the additional educational facts and keywords, video resources, additional interactive learning activities, and discussion questions to spark curiosity in your child.

If you ever need assistance, you can reach out to us at support@lilyandthistle.com. We are here to help!

And as always, remember Art Makes You Smart!
-Hannah and Team Lily & Thistle

Honeycomb Hexagons

Supplies Needed for Projects



Honeycomb Hexagon Drawing

- Watercolor paper
- Compass
- Drawing pencil
- Ruler
- T-square
- Kneaded eraser
- Painters Tape

Honeycomb Hexagon Painting

- Honeycomb Hexagon drawing
- Watercolors
- Paintbrushes
- Painters tape
- Cup of water

Tips and Tricks

- Complete the Honeycomb Hexagon Drawing first, because you'll need it for your painting.
- Watch each video through one time to see what you'll be doing. As you complete the project, pause the video to allow more time on a certain area.

Tips for Younger Artists

- For watercolor, try using water brush pens
- Print any outlines directly on card stock paper instead of watercolor paper (size 8.5 x 11)
- When in doubt crayons and colored markers can be used
- Use a tray (or cookie sheet) to keep art in one place
- Wear an art smock or clothes you don't mind getting dirty

Scan the QR code or click [here](#) to view the exact supplies we used.

Honeycomb Hexagons
Resources



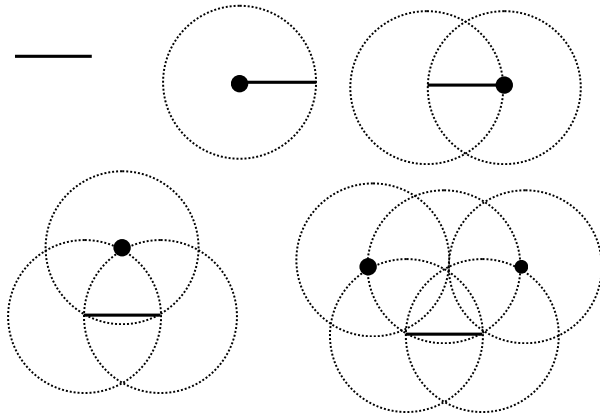
Scan the QR code with your phone

Honeycomb Hexagons

Using a Compass to Construct a Hexagon

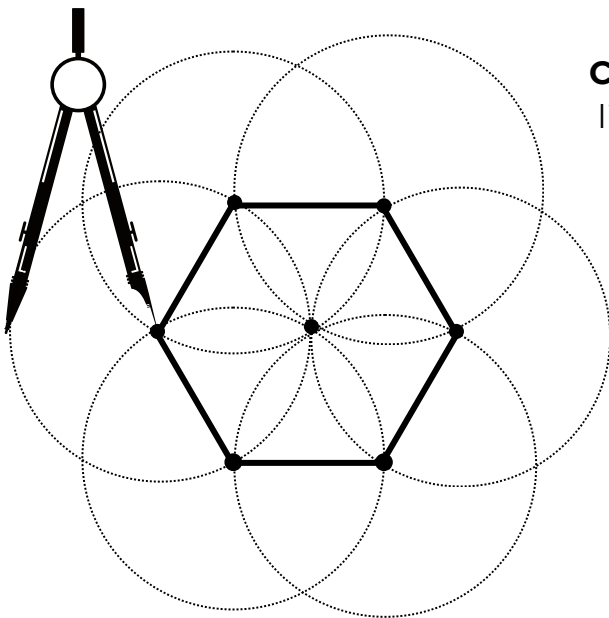
Draw a circle: Start by placing the sharp end of your compass at the center of where you want your hexagon to be.

Then, open up the compass so it's wide enough to draw a circle of the desired size. With the compass firmly in place, rotate it all the way around, drawing a complete circle.



Divide the circle: Now, leaving the compass at the same width, place the sharp end of the compass anywhere on the circle you just drew. Make a mark where the compass intersects the circle in two places. These marks divide the circle into six equal parts.

Connect the dots: Using a ruler or straightedge, draw straight lines connecting each pair of adjacent marks on the circle. You'll start to see the outline of your hexagon forming as you connect the dots.



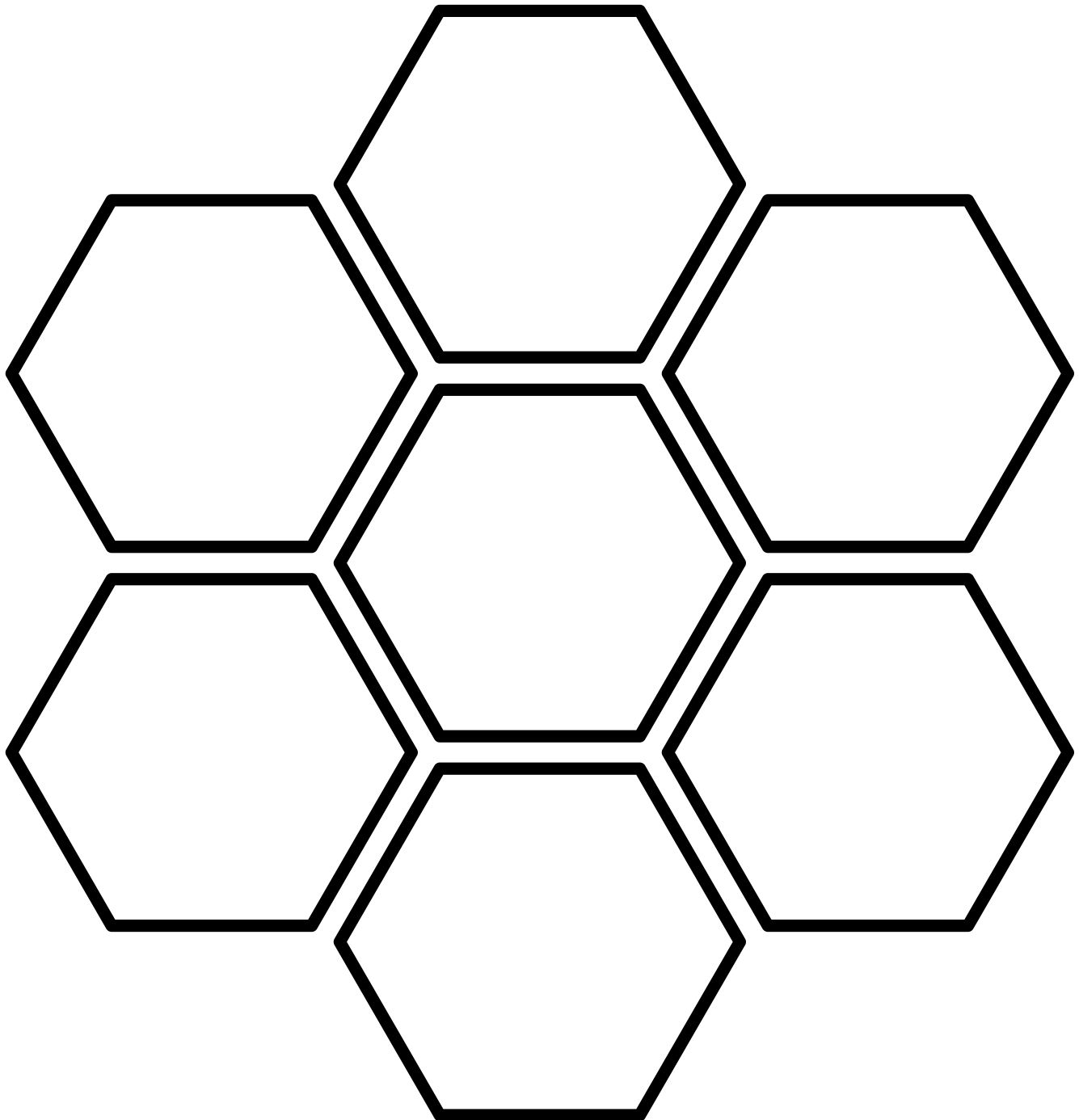
Complete the hexagon: Once you've drawn lines connecting all six pairs of marks, you'll have a complete hexagon!

By using your compass to draw a circle and then dividing it into six equal parts, you can easily construct a hexagon.



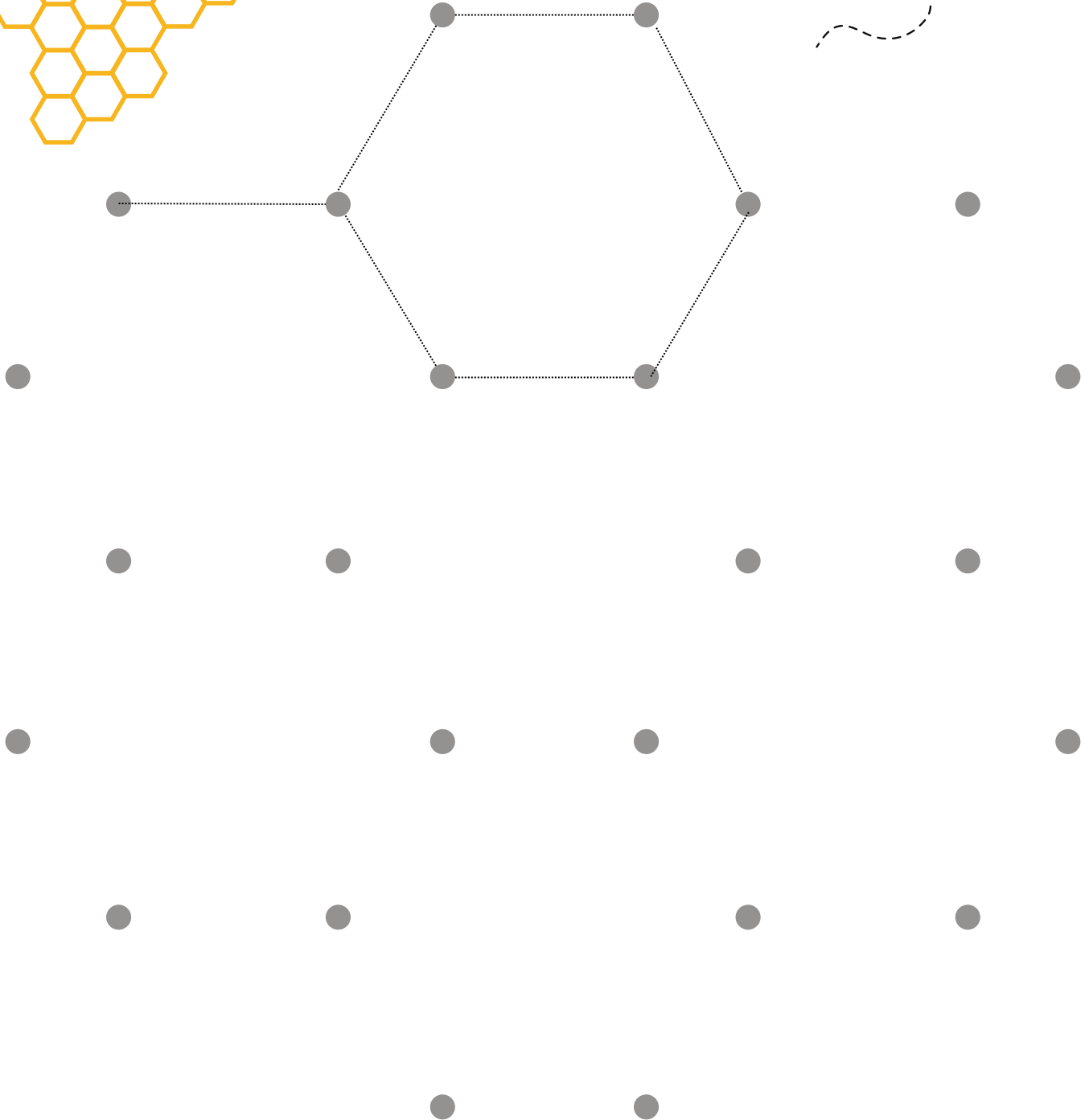
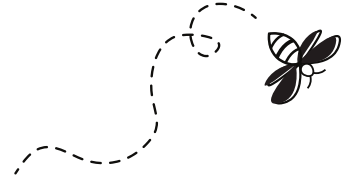
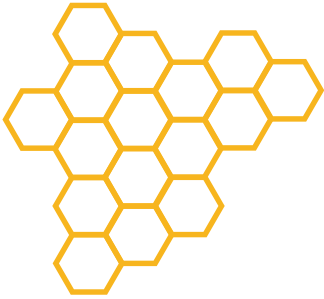
Adaptations for Little Artists and Mathematicians

Use this template to color in your own honeycomb. You can also trace the outlines onto watercolor paper and use watercolors to paint.



Busy Bees

Use a ruler to connect the dots and build some honeycomb hexagons. Then paint or color it overlapping different shades yellow, orange, and brown.



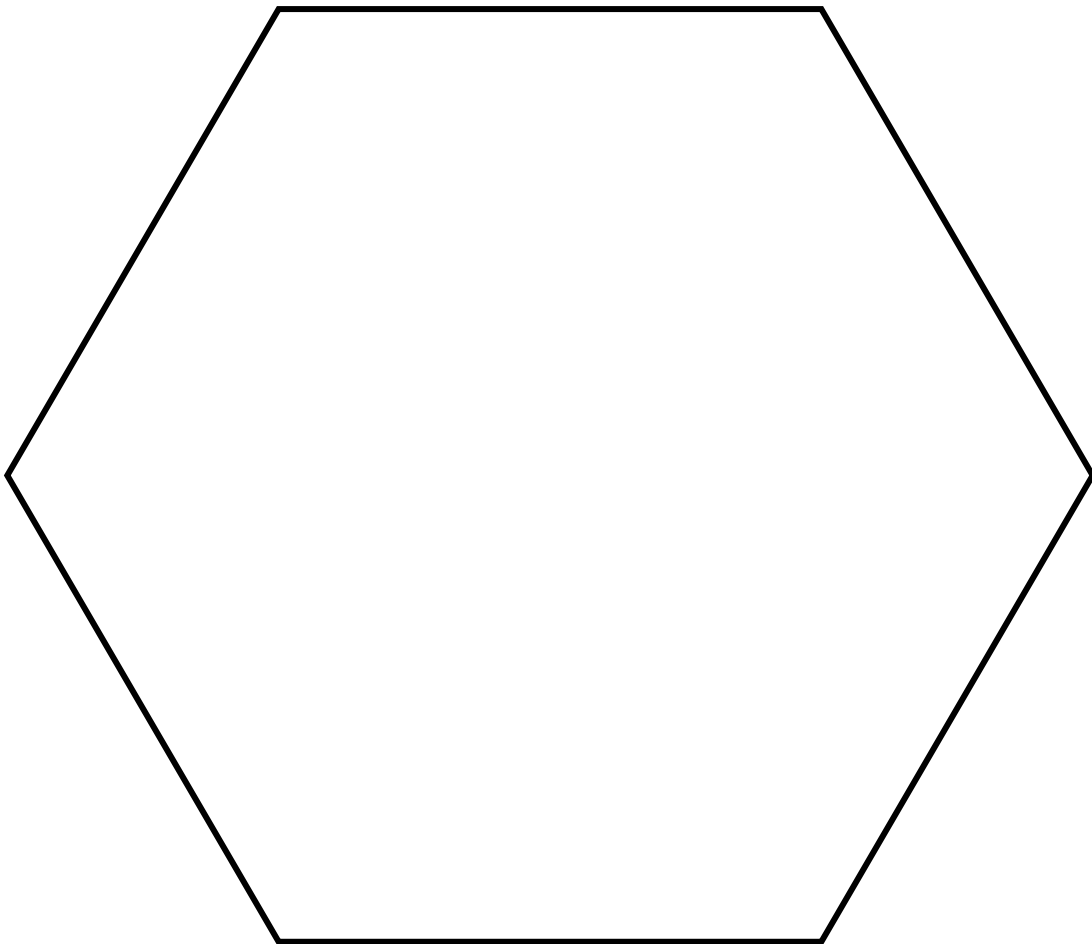
Hexagon Fractions

Use a ruler to connect opposite corners . What shapes did you make?
How many do you count?

You divide the hexagon up into six equilateral triangles. When we divide a whole into equal parts, it is called a fraction.

Color in 3 of the 6 triangles.

We write that fraction like this: $\frac{3}{6}$. How much of the hexagon is colored? You might notice that $\frac{3}{6}$ is the same as half (or $\frac{1}{2}$) of the hexagon!



Expand Your Knowledge

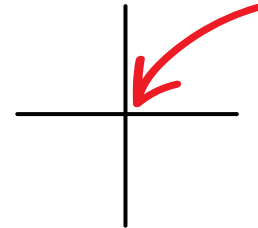
Geometry - the mathematical study of shapes

Euclid - Greek mathematician who lived around 300 B.C. and is best known for his book Euclid's Elements



Equilateral Triangle - A shape with three sides of the same length

Intersection - Where two or more sets of lines meet or overlap.



Tessellation - A pattern with shapes that don't overlap or have gaps

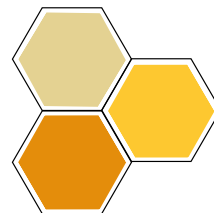
Mother Theresa - A woman who spent her life in India helping the sick and poor. Her efforts may have seemed small but they mattered to the one person that she was trying to reach



Value - The lightness or darkness of a color



Color variation - Using a combination of light and dark colors to create an interesting composition



Match It Up

Draw a line to match the word with its corresponding definition.

Euclid

- The mathematical study of shapes

Equilateral

- Where two or more sets of lines meet or overlap.

Triangle

- The lightness or darkness of a color

Intersection

- Greek mathematician who lived around 300 B.C. and is best known for his book Euclid's Elements

Tesselation

Mother Theresa

- Using a combination of light and dark colors to create an interesting composition

Color variation

- A woman who spent her life in India helping the sick and poor. Her efforts may have seemed small but they mattered to the one person that she was trying to reach

Value

Geometry

- A pattern with shapes that don't overlap or have gaps
- A shape with three sides of the same length

Video Resources

Continue learning about hexagons in nature, the importance of bees, and more through these fun videos! Click the video below or scan the QR code for the full video list.

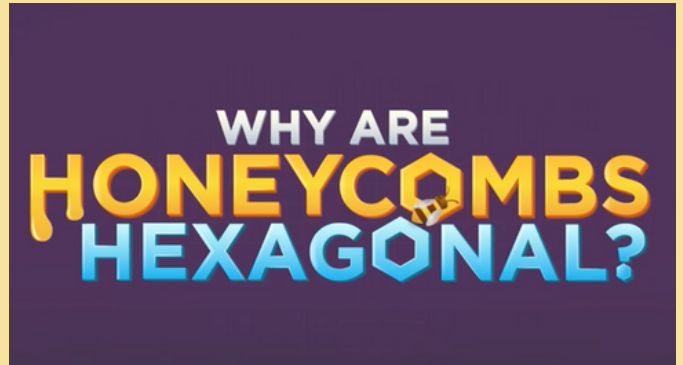
Honeycomb Hexagons
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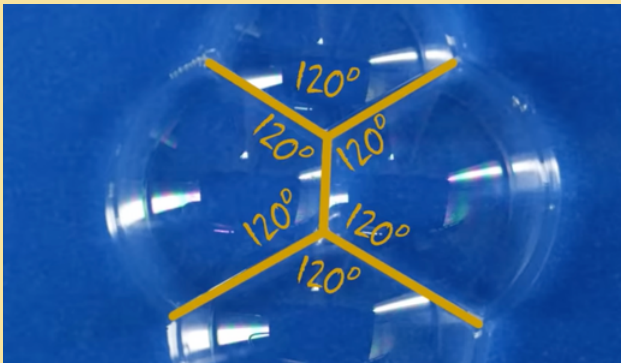
Scan the QR code with your phone



Why Do Bees Build Hexagonal Honeycombs?



Why Are Honeycombs Hexagonal?



Why Nature Loves Hexagons



The Power of Pollinators



How Do Bees Make Honey?



Why Are Bees Important?

Continue the Discussion

Discussion Prompts

Can you think of examples of hexagons found in nature?

Discuss examples like honeycombs in beehives, the structure of certain crystals, the pattern on a turtle's shell, and the shape of snowflakes.

What are some unique properties of hexagons?

Explain that a hexagon is a six-sided polygon with six equal-length sides and six equal angles. It's also one of the most efficient shapes for tiling a plane without leaving gaps.

Why do you think hexagons are common in nature, especially in structures like honeycombs?

Discuss how hexagons use space efficiently and require less material to create strong structures, making them a practical choice in nature.

Activities

Hexagon Scavenger Hunt:

Go on a scavenger hunt to find hexagonal patterns around your home or neighborhood. Take photos or make quick sketches of the hexagons you find. Examples might include tiles, nuts and bolts, or natural patterns.

Hexagon Art:

Materials: Construction paper, scissors, glue, markers.

Cut out multiple hexagons from colored construction paper. Arrange and glue them on a larger sheet to create a mosaic or tessellation. Add designs or patterns within each hexagon to create a unique piece of art.

Hexagon in Architecture:

Research and discuss examples of hexagon-based architecture. Look at famous structures like the hexagon pavilion at the Expo 67 or modern uses in building designs. Draw inspiration from these examples and have your child design their own hexagon-based structure.

Building Hexagons with Natural Materials:

Materials: Twigs, small sticks, clay or playdough.

Use twigs or small sticks to construct hexagons. Connect the ends with clay or playdough to hold the shape together. Create a small hexagonal honeycomb structure.

Continue the Discussion

Reflection Questions

What did you learn about hexagons in nature?

Discuss the efficiency and strength of hexagons and why they are commonly found in natural structures.

What was challenging about creating a hexagon with a compass?

Talk about any difficulties your child faced while using the compass and how they overcame them.

How do hexagons compare to other shapes you know?

Encourage your child to think about the differences and similarities between hexagons and other shapes like squares, triangles, and circles.

Can you think of other places where hexagons might be useful?

Discuss potential uses of hexagons in design, architecture, technology, and other fields.

