HexActly®
Congruently Cool

Learning Guide

For Hextended Knowledge

Fat Brain Toy Co.
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www.fatbraintoyco.com
Elkhorn, NE

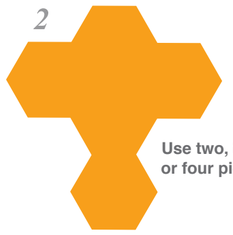
Please keep all relevant information.
Made in China.

Beginner

1

Use one, two or three pieces.

2



Use two, three or four pieces.

3

Use two, three or four pieces.

4

Use two, three or five pieces.

5

Use two, three or six pieces.

6

Use three, four or six pieces.

7

Use two, four or five pieces.

Intermediate

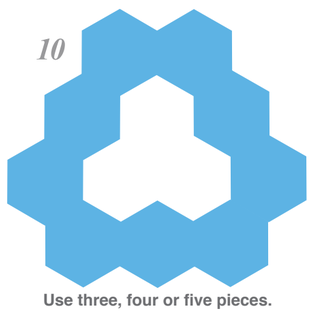
8

Use three, four or five pieces.

9

Use three, four or five pieces.

10

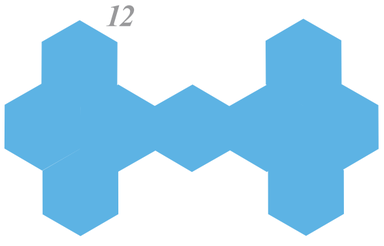


Use three, four or five pieces.

11

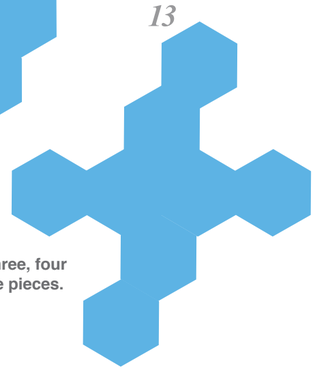
Use three, five or seven pieces.

12



Use three, four or six pieces.

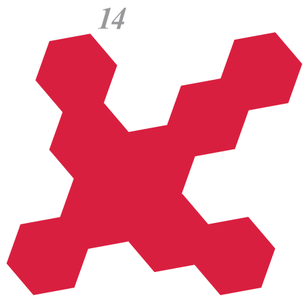
13



Use three, four or five pieces.

Hexpert!

14

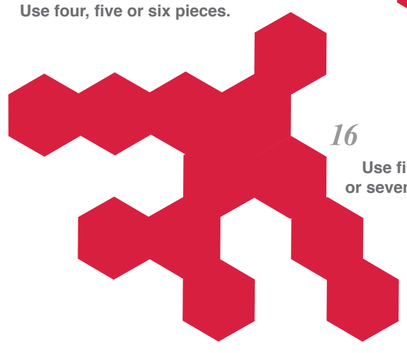


Use four, five or six pieces.

15

Use four, five or six pieces.

16



Use five, six or seven pieces.

17

Use six, seven or eight pieces.

18

Use five pieces in three different ways.

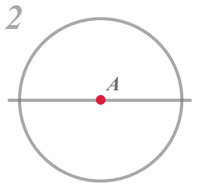
Draw a regular hexagon using a compass and ruler.

Paper and pencil also required.

1

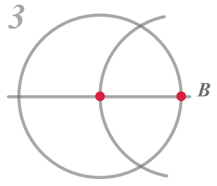
First, draw a straight line with the ruler and find the center.

2



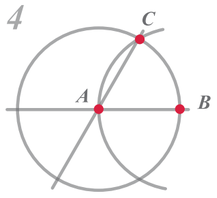
Place the point of the compass on the center, (point A) and draw a circlethat connects through the line.

3



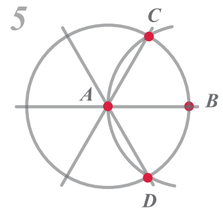
Next, use point B to draw a half circle which crosses through the center of the main circle.

4



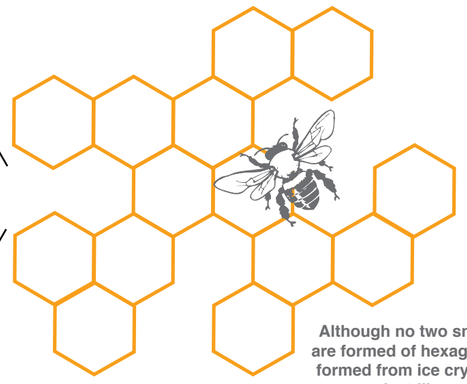
Draw a straight line through point C and point A with the ruler.

5

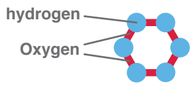


Now draw a straight line through point D and point A.

Honeycombs are natural hexagonal structures built of wax by bees to store honey. Bees use the hexagon because it is the most efficient shape for building. A hexagon has the least perimeter for tightly packing an infinite number of cells. Each wall of a honeycomb cell is also a wall of an adjacent cell. These natural storage facilities use less wax (building material) than any other shape.



Although no two snowflakes are identical, they are formed of hexagonal shapes. Snowflakes are formed from ice crystals made of hydrogen and oxygen, just like water. There are two hydrogen molecules for each oxygen molecule (H_2O). Just add a cold blast of air (O) and you have snow!



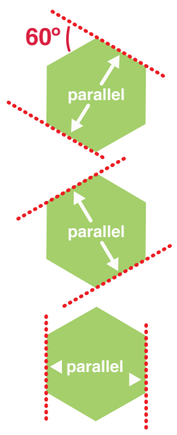
How many ways can you create this shape?

Use only the blue HexActly pieces.

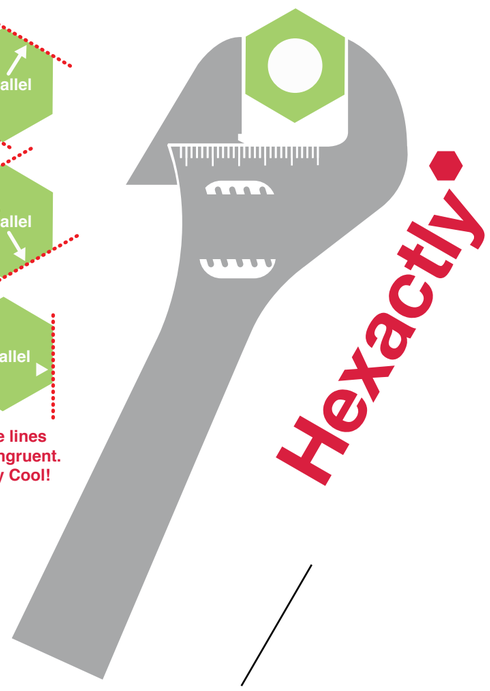
We found four possibilities. Can you find more?

Nuts and bolt heads are hexagons. Because a hexagon has three pairs of parallel faces, a wrench can be placed over any of the two paralell faces at any given time.

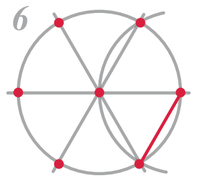
When the wrench is turned 60° (the exterior angle of a hexagon) it is re-positioned on the next pair of paralell sides.



These lines are congruent. Pretty Cool!

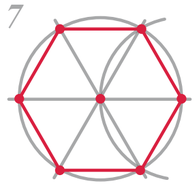


6



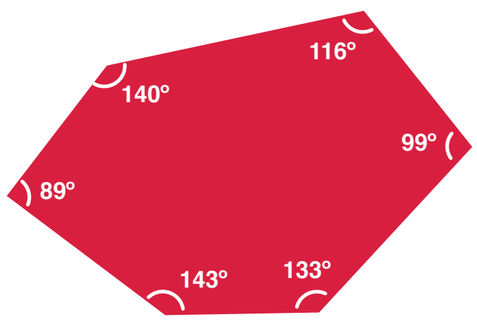
All corners of the hexagon are now in place. Using the ruler, draw a line conecting the points.

7



Complete the hexagon by connecting all six points.

An irregular hexagon also has six sides. However, the six sides and interior angles are not equal. The sum of the interior angles still equals 720°



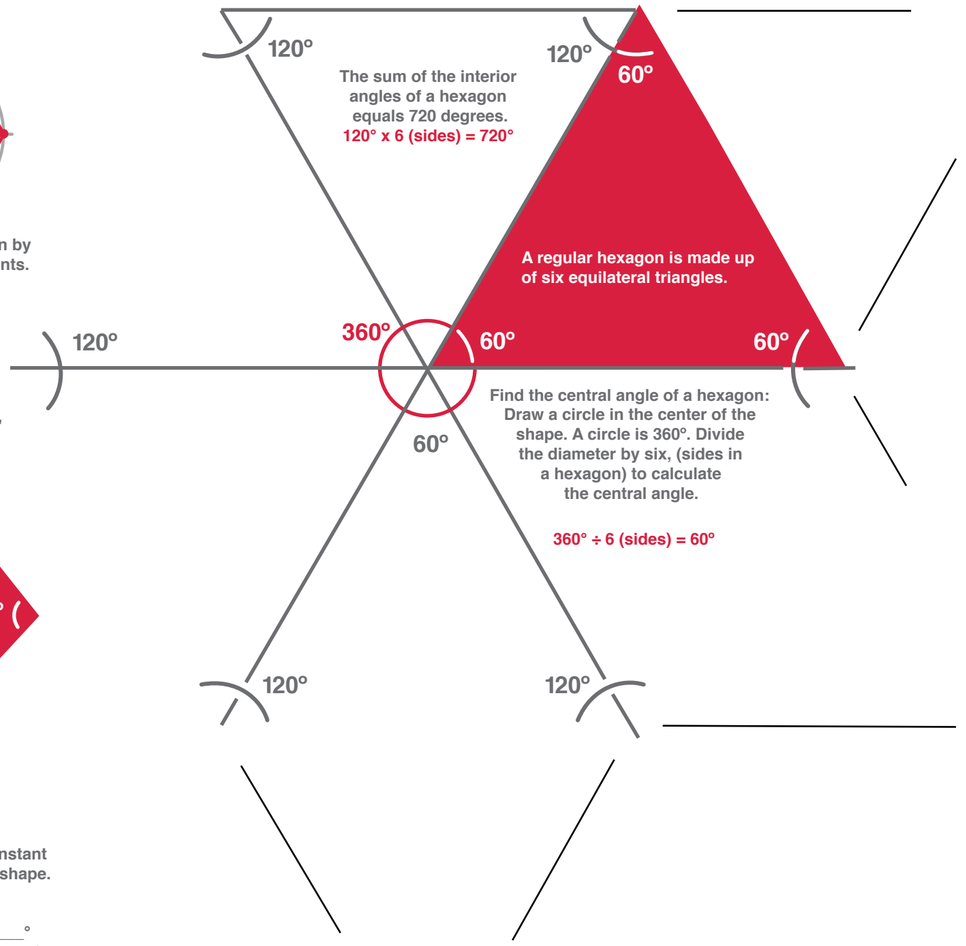
116° + 99° + 133° + 143° + 89° + 140° = 720°

The interior angles of any polygon always add up to a constant value, which depends only on the number of sides of the shape.

Calculate it!

A square has 4 sides. The interior angles add up to:_____°
A pentagon has 5 sides. The interior angles add up to:_____°
An octagon has 8 sides. The interior angles add up to:_____°

Square = 360° Pentagon = 540° Octagon = 1080°



The sum of the interior angles of a hexagon equals 720 degrees.
120° x 6 (sides) = 720°

A regular hexagon is made up of six equilateral triangles.

Find the central angle of a hexagon: Draw a circle in the center of the shape. A circle is 360°. Divide the diameter by six, (sides in a hexagon) to calculate the central angle.

360° ÷ 6 (sides) = 60°