

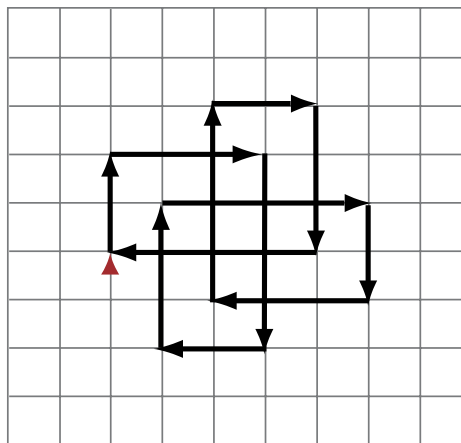
AFTERSCHOOL TRAINING TOOLKIT

math Centers

Helix-a-graph

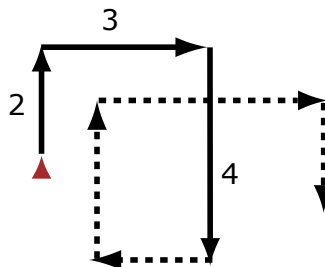
Helix-a-graphs are drawings, usually created on graph paper, made by following certain number patterns. To create a helix-a-graph, all you need is a piece of graph paper, a pen or pencil, and a mind for investigation! As you are working, be sure to pay attention to any patterns you see. (Note: if you'd like, you can use colored pencils to fill in your drawings and help you identify schemes and patterns)

Here is an example of a helix-a-graph, created with the digits 2-3-4:



The red triangle marks the beginning point. Notice how if you follow the arrows, your pattern moves in a clockwise direction? Helix-a-graphs are created when one follows a set of rules, and the first rule is to draw lines in this clockwise fashion. You will always start by drawing a line up, then right, then down, then left.

Starting at the red triangle, notice that the first arrow up is 2 units long. The next arrow to the right is 3 units long. The next arrow down is 4 units long. The next arrow to the left is 2 units long, because the number pattern just repeats itself. Continue the pattern 2, 3, 4, until the arrow ends up at the starting point.



Now it is your turn! Start by choosing 3 digits and a starting point on a piece of graph paper. Remember to move in a clockwise direction.

Investigation

You may want to choose some of the numbers you use for helix-a-graphs intentionally so you can look for patterns. These questions will get you started.

1. Try various combinations of 3-digits to create helix-a-graphs. What digits did you try and what patterns do you see?
2. Now try creating helix-a-graphs with more or less than 3 digits. Can you make 4-digit helix-a-graphs? 5-digit helix-a-graphs? 2 digit helix-a-graphs? What do you notice?
3. Are there any helix-a-graphs that go on forever? Describe these, if you find them.
4. Compare your helix-a-graph with your center group. What characteristics are the same? Different?