



Skip Pattern Grades 9-12

Introduction

This activity requires students to work together to make sense of a visual pattern. There is space in this activity for students to experience multiple ways of seeing patterns and working to describe and explain what they see. This pattern is different from other patterns they may have seen because this visual shows every fifth case. This may be confusing to students at first. Give them freedom to explore the patterns in the different ways they choose.

Agenda

Activity	Time	Description	Materials
Introduction and Work Time	15 min	Introduce students to the pattern and the questions. <ul style="list-style-type: none"> Invite students to explore thinking about what case 45 might look like. What would case 8 look like? How are they seeing the pattern? 	<ul style="list-style-type: none"> Skip Pattern Handout Square tiles or square post it notes Color pens/pencils Poster paper and markers
Whole Class Discussion & Additional Work Time	15 min	<ul style="list-style-type: none"> As a class, invite students to share the different ways they visualized the pattern. If they haven't yet, ask students to generalize the pattern. How many tiles would be in any case? Celebrate the different ways they may do this using tables, graphs, or other methods 	



Debrief	15 min	<ul style="list-style-type: none"> • Invite students to share their generalization. • Is this equation familiar to them? What relationship does this pattern model? Some students may recognize it as the pattern that converts Celsius to Fahrenheit. The temperature in Celsius would be the case number and the conversion to Fahrenheit would be the number of tiles. Ask students: How does the visual help you in considering the conversion between Celsius and Fahrenheit? What would a visual pattern be for converting Fahrenheit to Celsius? • Invite students to do some temperature conversions given the work they have done so far. Can they make the conversion without pencil and paper because of their visual understanding of the pattern they have analyzed? 	
---------	--------	--	--

Activity

Give students the Skip Pattern Handout. Ask them to explore the pattern and make a visual display to share with the class. We do not scaffold this task or discuss it with students before beginning. We want students to bring their own creativity to the work. You will know this has been achieved when group work looks different. This makes the conversation much more interesting later when students share. Encourage students to color code and connect their visual representations to their numerical and algebraic generalizations. We begin with asking students to create a visual for what a case might look like. This beginning makes this task low floor/high ceiling. We ask what case 45 might look like? What might case 8 look like? What would case -5 look like? Once students are grounded in the pattern visually we ask for numerical and abstract generalizations. Give lots of time for students to explore different ways of seeing how the pattern is growing. Students should feel free to color code and explore the pattern. They might even rearrange it to make a different shape at each case. Encourage students to share all their ways of seeing, say things like, “The more ways you see the pattern the more strategies your group will have when thinking about what any case looks like.”

As a class, invite students to share the different ways they visualized the pattern. If they haven’t yet, ask students to generalize the pattern. How many tiles would be in any case?



What relationship does this pattern model? Invite students to share their generalization. Is this equation familiar to them? What relationship does this pattern model? Some students may recognize it as the pattern that converts Celsius to Fahrenheit. The temperature in Celsius would be the case number and the conversion to Fahrenheit would be the number of tiles. How does the visual help in considering the conversion between Celsius and Fahrenheit? Invite students to do some temperature conversions given the work they have done so far.

Visual representations of math can be valuable in helping us to make sense of content. Much of the work mathematicians do is visual. As students work on math throughout the year, consider ways you can represent the content you are working on visually.

Extensions

- Create a visual pattern for the equation that converts Fahrenheit to Celsius.
- Create a visual pattern for another formula.

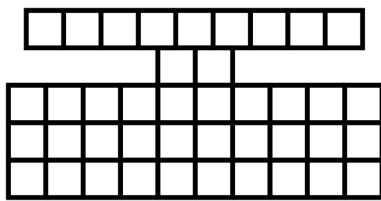
Materials

- Skip Pattern Handout
- Square tiles or square post it notes
- Color pens/pencils
- Poster paper and markers

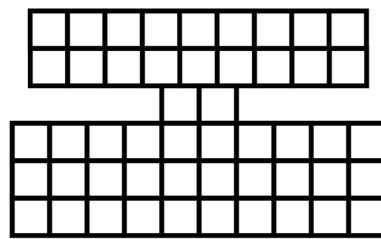


Skip Pattern Handout

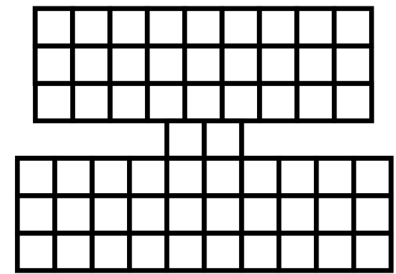
How do you see the pattern growing?



Case 5



Case 10



Case 15

What would case 45 look like?
What would case 8 look like?
What would case -5 look like?
How many squares would be in case 100?
How many squares would be in any case?