

Penny Collection

This activity allows students to explore how numbers are composed, by having them look at different ways of grouping them. There are many different strategies and methods students can use to come up with a solution. Students can use actual pennies, draw diagrams, and use charts to keep track of their findings. As students explore they will notice many different patterns in the numbers they are exploring.

Task Instructions:

Consider a collection of pennies with the following constraints:

When the pennies are put in groups of 2 there is one penny left over. When they are put in groups of three, five and six there is also one penny left over. But when they are put in groups of seven there are no pennies left over. How many pennies could there be?



Materials:

- Hundred Chart
- Pennies or Counters
- Colored Pencils or Pens

Extensions:

- What would be the next number that would also work in this situation? Can you find a rule for finding all of the solutions?
- How many pennies are in your collection if you had one penny left over when you put your pennies in groups of 2, 3, 4, 5, and 6 and no pennies left over when you put your pennies in groups of seven?

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Introduction

This activity allows students to explore how numbers are composed, by having them look at different ways of grouping them. There are many different strategies and methods students can use to come up with a solution. Students can use actual pennies, draw diagrams, and use charts to keep track of their findings. As students explore they will notice many different patterns in the numbers they are exploring.

Agenda

Activity	Time	Description/Prompt	Materials
Mindset Message	10 min	Play the mindset video, <i>Strategies for Learning Maths</i> , https://youcubed.org/weeks/week-4-grade-3-5/	Mindset Video day 4, <i>Strategies for Learning Maths</i>
Explore	25 min	<ul style="list-style-type: none"> Introduce the problem. Give students time to explore penny collection 	<ul style="list-style-type: none"> Counters or pennies Hundred chart Maths journals Pencils Colored pencils or pens Calculators (optional)
Discuss	10 min	Invite students to share their findings: What patterns did they notice? What strategies did they use?	
Debrief Mindset Message	5 min	Ask students to reflect on all the Strategies for Learning Mathematics from the video: 1) Draw it out, 2) Teamwork, 3) Experiment, 4) Look for different resources, 5) Start with a smaller case. Highlight some moments when you saw individuals and groups using these strategies or ask students to share when they used the strategy or saw someone else use the strategy.	

Activity

Introduce the problem to students by giving them the handout and access to counters or pennies, and hundred charts. Invite students to work with a partner on this problem and use any resources they need to solve the problem.

As students are working, notice how they are recording their findings. What strategy are they using to explore different numbers? When students get stuck, encourage students and remind them that struggle and challenge are good for brain growth.

After students have worked for about 10 minutes consider pausing the class to invite them to share some of their different findings with the class. Let them know this is not about sharing the answer, this is about hearing what other students have noticed, such as the number being a multiple of seven. Invite them to also share strategies they are using to explore numbers and ways they are recording their findings. This is a good time to emphasize that the class is a maths community and we all learn by working together and sharing our different ideas.

Following this discussion, give students more time to explore. Students will likely take some of the ideas shared and build off of those ideas along with their previous work in different ways. Continue to notice different ways students are approaching the problem and different 'Aha!' moments students are having. Consider asking a student in advance if they would be willing to share with the class an aspect of what they have discovered.

After students have had additional time to explore, bring students together for a continuation of your discussion. Invite students to share what additional findings they have made. Even if a student presents a solution, continue to have students share their different ways of approaching the problem. Let students know that what we value in maths are different strategies and ways of seeing problems.

Extensions

- What would be the next number that would also work in this situation? Can you find a rule for finding all of the solutions?
- How many pennies are in your collection if you had one penny left over when you put your pennies in groups of 2, 3, 4, 5, and 6 and no pennies left over when you put your pennies in groups of seven?

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When the pennies are put in groups of 2 there is one penny left over. When they are put in groups of three, five and six there is also one penny left over. But when they are put in groups of seven there are no pennies left over.

How many pennies could there be?

Hundred Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100