youcubed® + polyup

Youcubed has joined with Polyup to create interactive lessons where students use Poly, their AI sidekick, to explore mathematical relationships. The student goal is to modify (mod) the poly machines. Each Machine contains 1 or more Chips that are representations of the problems posed in the Machine. In each case we have thought about learning goals that are important steps in a path towards deeper understanding of mathematical concepts. It is our goal for students to explore, create and make mistakes as they help Poly learn to solve problems.

Poly's Coin Stacks

This machine is an adaptation of one of our favorite youcubed problems, Visual Number Pennies. This activity asks students to think of coin stacks, on visual number representations. Their goal is to not only find solutions but find how many solutions there are. Students will explore numbers, their multiples and combinations of them as they use their AI sidekick, Poly, to help them manage a problem with many different solutions.

Student Engagement:
When engaging students in these lessons we recommend they interact with the content in many different ways. Interacting across representations makes the learning greater. Ideas for lesson engagement could be...

- drawing to visualize the problem
- justifying/proving their thinking through drawing, speaking and writing
- color coding words to symbols to drawings
- making up another problem
- creating a similar problem

We love the engagement of the lessons where students are reading to understand a problem and then reading, writing and evaluating the machine text that makes Poly operaate. We believe students will engage in all of the Standards of Mathematical Practice when they engage with our youcubed Polyup machines and lessons.

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8.Look for and express regularity in repeated reasoning

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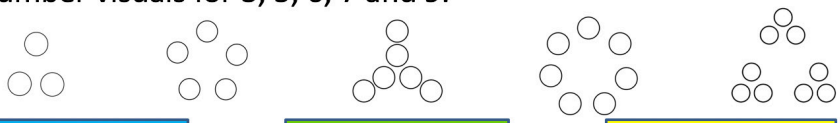
Number Visual Pennies: An Extension

Imagine you have pennies stacked in the patterns of the number visuals for 3, 5, 6, 7 and 9.



Each number visual has stacks of pennies

The stacks of pennies inside each unique number visual are equal

Each number visual can have different size stacks of pennies than the other number visuals

What would be the size of each stack of pennies inside each number visual if the sum of the pennies is $1.00? Is there more than one solution? How many solutions are there? How could you modify this task?