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## Math and the Moon activity plan

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## **Ready, Set, Fold! Activity Plan**

Name of activity:

Ready, set, fold!

What topic does this activity relate to?

Math, exponential growth, conversions

What should the students learn by the end of this activity?

- Students should...
  - Have a basic understanding of exponential growth
  - Understand measurement conversions (such as cm to km)
  - Understand that it is only possible to fold paper a certain number of times

Tools/supplies needed: (for a class of 30)

- 15 rulers (mm)
- 15 sheets of paper
- 15 measurement tables (attached)
- 1 conversion visual (attached)
- 1 exponential graph visual (attached)
- 1 example measurement table (attached)

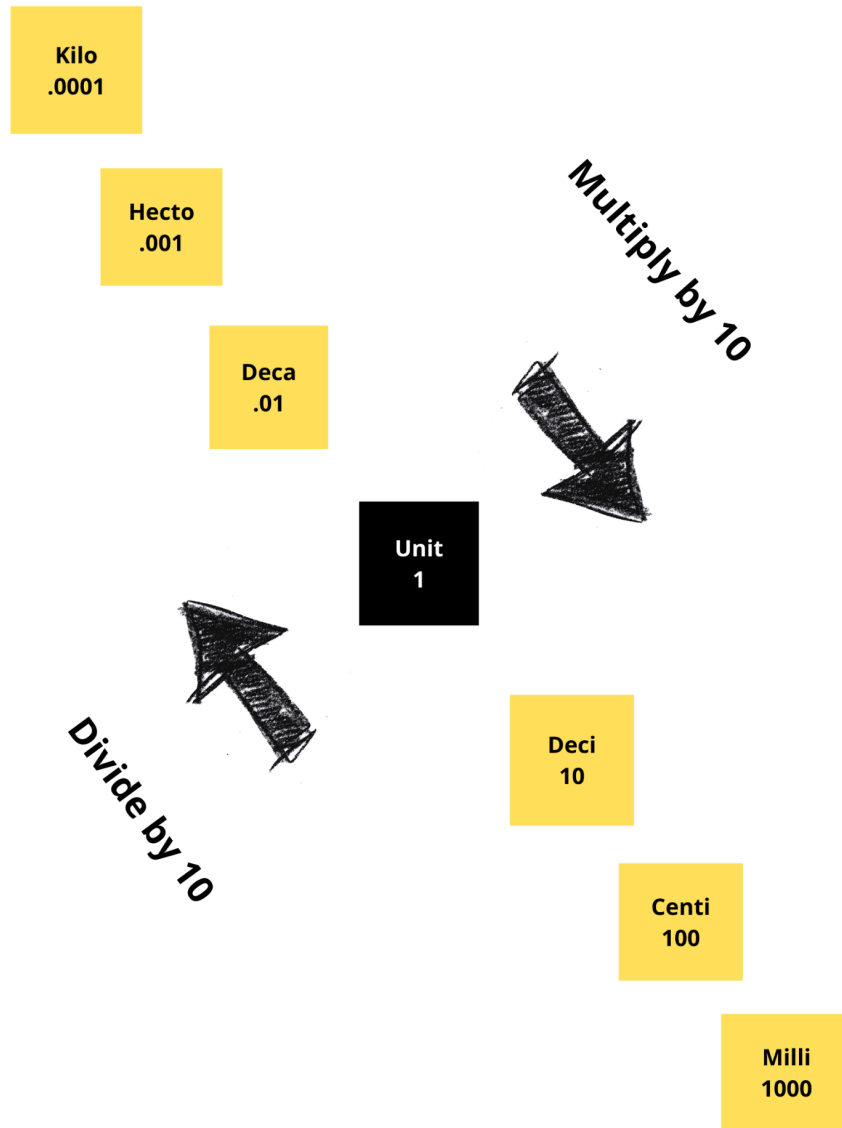
Total price:

- If using previously owned rulers (tables can share) and copy paper about \$0.30 for a class of 30.  
(One sheet of copy paper is usually maximum 2 cents a piece, students will be in partnerships).

Step-by-step instructions on how to conduct the activity

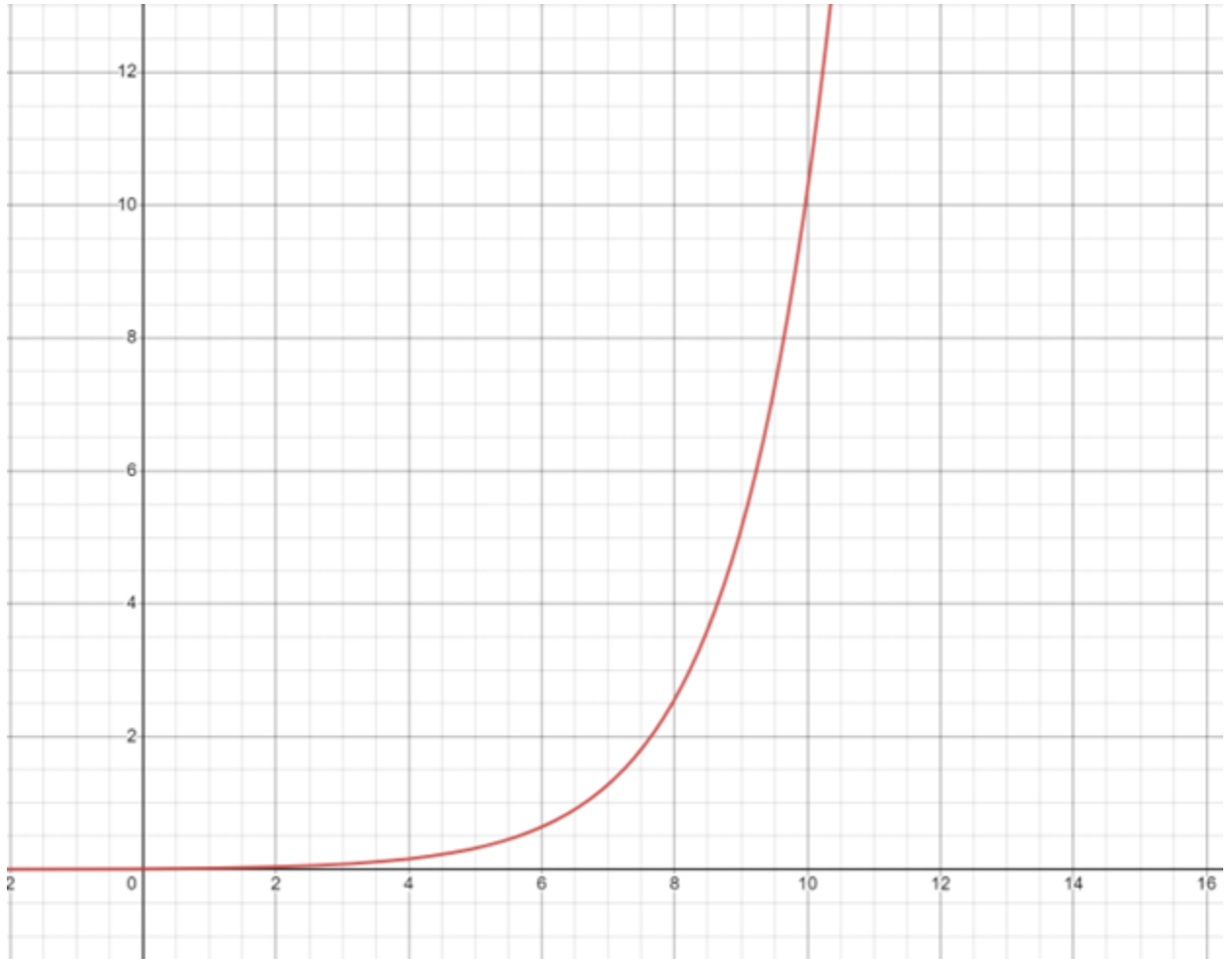
1. Have students work in partnerships
2. Hand out one ruler and one sheet of copy paper to each group.
3. Have students guess how many times they will be able to fold their paper in half, and write this number on their blank sheet of paper.
4. Hand out one measurement table (attached below) to each group.
5. Students should start folding their paper in half and measuring the height of their paper in mm.
6. Instruct them to try converting their measurements from mm to cm and km after each fold.

7. Once their sheets are all filled out, show students the example sheet (attached below)
  - a. Their measurements may not be the same, but their conversions should follow the same pattern.
8. Show them how to correctly convert between mm, cm, and km. Here is a visual we've created that is helpful in explaining conversions:



**\*\* Note:** You can pair this visual with the acronym “King Henry Died Unusually Drinking Chocolate Milk”

9. Allow time for students to reflect with their partners on the following questions:
- How did the amount of times you guessed you could fold the paper in half compare to the real number of times you folded it in half? Did this surprise you?
  - Why do you think the height of the paper grew so quickly?
  - What did you learn about converting measurements? What questions do you still have?
10. Have partnerships share out with their answers, discuss that the thickness of the paper grew exponentially. Show this graph if needed:



11. If your students viewed the *Math & the Moon* video, explain that we can't \*actually\* fold a piece of paper in half 42 times! Share out who was able to fold their paper the most and see who's sheet grew to be the thickest!

**Ready, set, fold!**

Measurement Table

10 mm = 1 cm  
100000 cm = 1 km

Number of Folds	Height (in mm)	Height (in cm)	Height (in km)
0			
1			
2			
3			
4			
5			
6			
7			
8			

**Ready, set, fold!**

Example table

$10\text{ mm} = 1\text{ cm}$

$100000\text{ cm} = 1\text{ km}$

Number of Folds	Height (in mm)	Height (in cm)	Height (in km)
0	.1	.01	.0000001
1	.2	.02	.0000002
2	.4	.04	.0000004
3	.8	.08	.0000008
4	1.6	.16	.0000016
5	3.2	.32	.0000032
6	6.4	.64	.0000064
7	12.8	1.28	.0000128
8	25.6	2.56	.0000256