



Please read the information presented carefully



Fill in your details, don't forget any



Socialize what you have learned or the questions that the teacher indicates with your classmates



Keep track of time: no hurry or delay



Check if you have everything you need for the activity



Explore the simulation freely, don't forget to visit all the windows



Let's remember what we've learned



Start working collaboratively and in a team to develop your knowledge



Show that you've learned about the topic by answering the questions in the What have I learned?



When you see this icon at the beginning of a section, remember to check all your answers with the simulation

Arithmetic Mean – Mathematics

Intentions of learning



- Analyze the concept of arithmetic mean in terms of leveling, fair distribution, and equilibrium point.
- Predict the effects of one or more outliers on the mean.



Previous Ideas



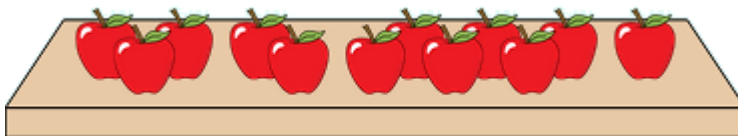
Activity time: 20 minutes

Name and surname:

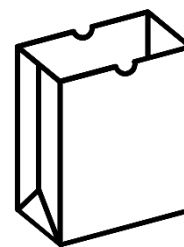
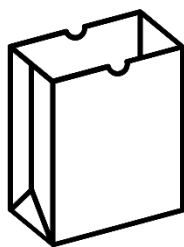
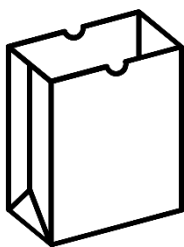
DNI/Identity Card/School ID/others:



On a table are 12 rich, juicy apples



With the help of a color and your pencil, draw the right distribution of the apples in the following bags:



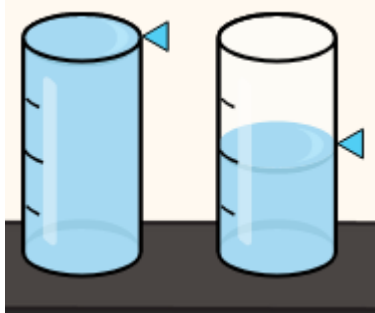
1. How did you manage to distribute the apples fairly? Explain your answer

2. How would you go about distributing the colored candies in such a way that everyone who participates is satisfied?

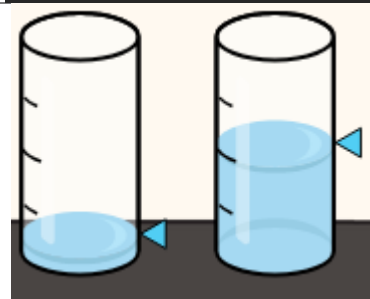
Reason your answer



3. In both cases: How would you get the water to the same level?

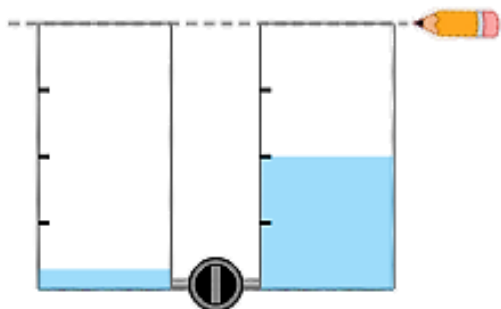


Explain your answer



Explain your answer

4. Draw on the image: What would be the level of the arithmetic mean if the key connecting the two vessels was opened?



Explain your answer

Socialize what you've learned: It's time to share ideas about the activities with your teammate, and then respond. How would you explain the concept of arithmetic mean based on the examples received?



Justify your answer

End of activity

Arithmetic mean

Intentions of learning



- Analyze the concept of arithmetic mean in terms of leveling, fair distribution, and equilibrium point.
- Predict the effects of one or more outliers on the mean.

Materials Needed



- Electronic devices: laptop, smartphone, or tablet
- PhET Simulation and the GeoGebra Tool
 - [Mean: Share and Balance](#)
 - [Arithmetic mean](#)



Let's learn by playing



Activity time: 60 minutes

Name and surname:

DNI/Identity Card/School ID/others:



Play around with the PhET simulation and the GeoGebra tool for 10 minutes.
Describe the three things you've discovered in:



[Mean: Share and Balance](#)

[Arithmetic mean](#)

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-
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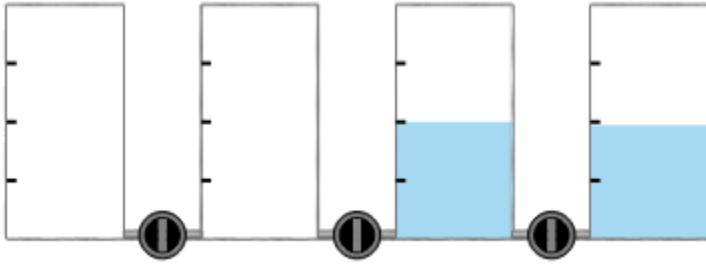
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Don't forget... Verify all your answers with the tools. Learn by playing!

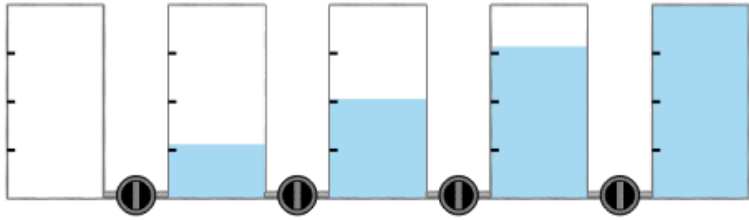
Finally, the simulation returns to its initial conditions of use. Remember... nothing in the PhET simulation is damaged.

1. According to your experience and according to the image, respond.



If the taps are turned on, draw on each container: Where would the stocking be?

Justify your answer



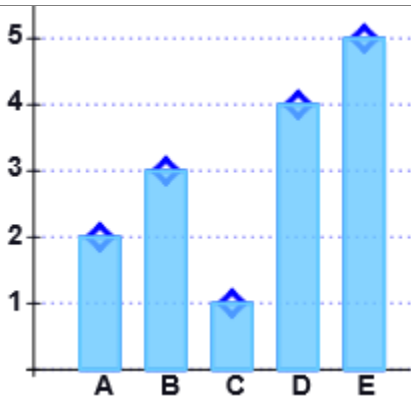
And now, where would the average be?

Justify your answer

2. How does the amount of water in each container affect the arithmetic mean?

Reason your answer

3. According to your experience and according to the image, respond.



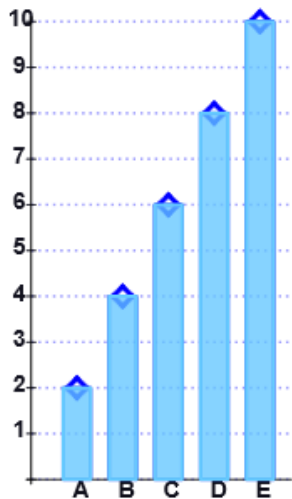
If you find the average: Predict which containers (you use the letters to point)

Increase your water level

Lowers your water level

Justify your answer

Justify your answer



If you find the average: Predict which containers (you use the letters to point)

Increase your water level

Lowers your water level

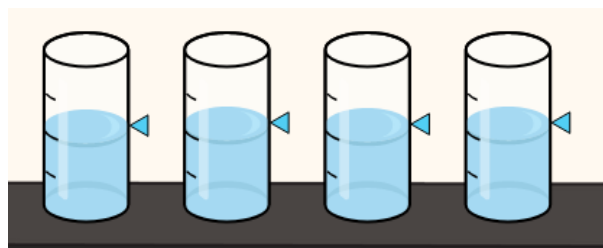
Justify your answer

Justify your answer

4. In both cases, which of the containers stays the same (same water level)? Why?

Reason your answer

5. According to your experience and according to the image, respond.



They all have the same water level, so the same average.

What will happen to the average? Yes

Increase the maximum water level of some of the containers

Reason your answer

You bring some of the containers to zero water level

Reason your answer

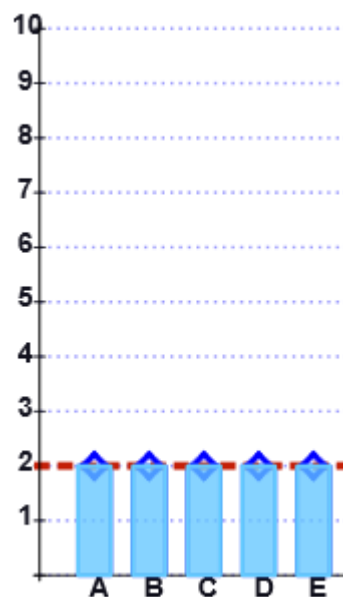
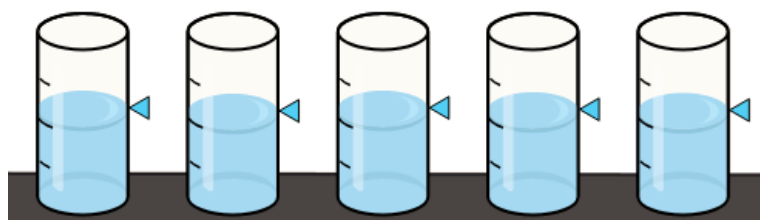
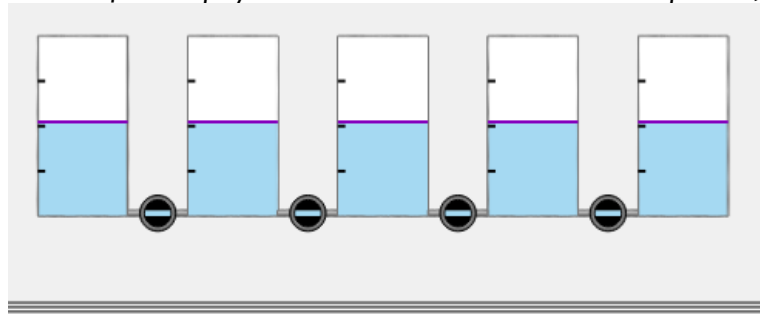
6. How do outliers (highs and lows) relate to the mean?

Reason your answer



Don't forget... Verify all your answers with the tools. Learn by playing!

Let's have fun and play with the simulation tools. Look at the pictures, they are containers with equal stockings.



7. Find two different ways to maintain the same arithmetic mean in either tool

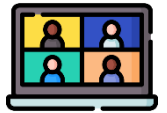
Procedure One

Procedure Two

Stop for a moment... Inform your teacher about the completion of your activities, if you have time to spare, check your answers and wait for the instructions

Reflect on what you've learned:

Discuss with your teammate the possible use you would give to arithmetic averages in your daily life, write down these reflections below



Reflections:

Share:

Share your reflections with the rest of the class and write down reflections from other groups that will help them better understand the topic.

Relevant findings from other groups:

End of activity



What have I learned?



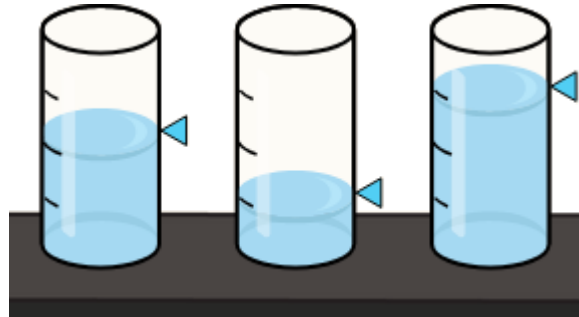
Activity time: 20
minutes

Name and surname:

DNI/Identity Card/School ID/others:

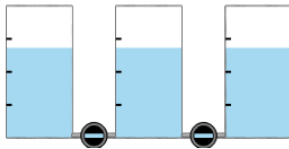


1. Under the following conditions:

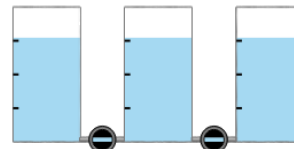


What would be the arithmetic mean?

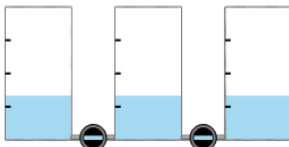
Option A ☐



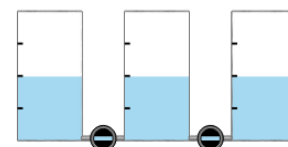
Option B ☐



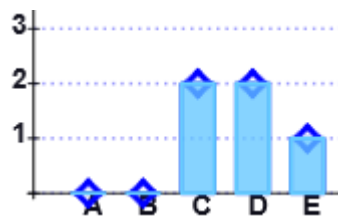
Option C ☐



Option D ☐



2. Take a look at the image:



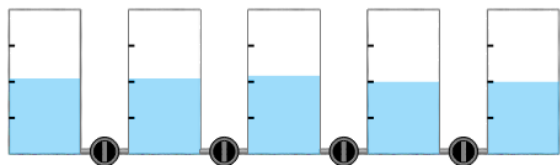
Which option is valid for the average?

- a) Containers C, D and E are lowered and A and B are not changed in level
- b) Containers A and B go up, C and D go down, and E doesn't change
- c) All containers go down or up to one as the case may be
- d) None of the above

Select

☐
☐
☐
☐

3. Under the following conditions:



Predict what will happen to the value of the arithmetic mean if...

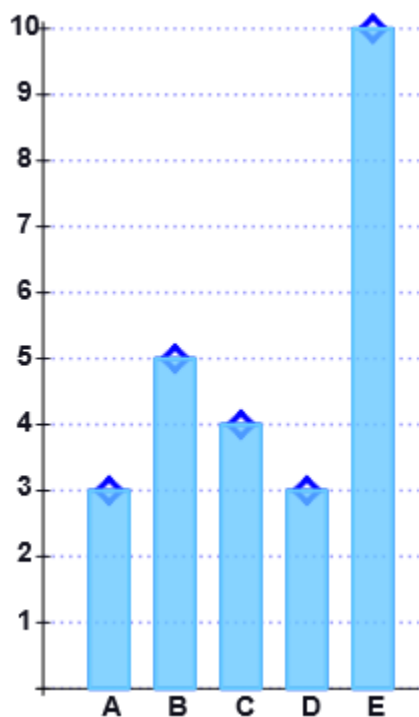
You lower water levels. Select:

- ☐ Increase the average
- ☐ Decreases the average
- ☐ Stay the same

Increases water levels. Select:

- ☐ Increase the average
- ☐ Decreases the average
- ☐ Stay the same

4. Under the following conditions:



Predict what will happen to each container when its average is determined

Select:

- ☐ A, B, C, D increases and E decreases
- ☐ A, C, and D increase and E decreases
- ☐ Levels do not vary

What is B's behavior? Select:

- ☐ Increase your level
- ☐ Lowers your level
- ☐ Follow Same is the average

End of activity