

➤ Notes for parents.**The purpose of the activity is to help your child to:**

- Measure weight using non-standard units.
- Establish equality as a balance.
- Realise that a measure includes a count and a unit.
- Apply logic to consider the impact of changing the unit.

Here is what to do:

Look at the activity page together. Ask your child to describe what the person has made. Look for them to say that the person is finding out the weight of the stapler in spoons. Children often relate balance to a seesaw at the playground. Ask, *“How do you know when you have enough spoons?”* Look for your child to describe a state of balance signalling equality. Children usually describe how it feels when one object is heavier, e.g. *“It pushes down harder.”* That is a good way to talk about weight since it is the force of gravity acting on an object.

Let your child create a **Coat Hanger Balance** from material you have. Don't give them too much help. It is good for them to solve the construction problems themselves.

Task One:

Be with them as they test their balance to measure three items from around the house. Dessert spoons are used as the non-standard unit in this task. Non-standard means that dessert spoons are not recognised by everyone as being the same weight. Standard units, like grams, are universally accepted as the same. This task should raise some important issues such as:

“How do you know the objects weigh the same?” (Coat hanger stays level)

“Are bigger objects always heavier?” *“Are smaller objects always lighter?”*

“Does the way you hold the coat hanger affect the balance?”

“How might you improve your device?”

“Is your balance sensitive enough?” (detects small differences)

“How could you improve your balance?” An important idea is that dessert spoons may be too insensitive as a unit for some objects. It may not be possible to balance the object with a whole number of dessert spoons.

“Would teaspoons be a better unit? Why?” Teaspoons are a lighter unit so you



➤ Notes for parents cont...

need more of them to balance the same object but they are more sensitive. "If you know the weight of an object in dessert spoons, can you predict the weight in teaspoons?" This is a difficult idea for children at this age as it requires use of a rate. For example, 1 dessert spoon: 3 teaspoons.

Task Two:

Next ask your child to predict how many dessert spoons will balance two objects put together. Units are additive which means when you combine them by joining weight is conserved. So an object that weighs 8 dessert spoons put together with an object that weighs 6 dessert spoons should weigh a total of $8 + 6 = 14$ dessert spoons. Look for the following:

Can they express a measure using numbers and units? e.g. 9 dessert spoons.

Can they use the language of measurement? e.g. I need more spoons because the stapler is still heavier than the spoons.

Do they recognise that combining measures is just like the addition of sets?

Points to note:

Weight is an attribute, that is, it is a characteristic that objects have. Weight is a tangible attribute because we can feel it. However, the appearance of objects can be deceiving as sometime objects look bigger than others but they are actually lighter. At this stage we want our children to be able to use non-standard units, like spoons and marbles. However, it is also important to discuss standard measures we see, like 500g on a can of spaghetti, and use measurement devices like kitchen and bathroom scales.

Using units for measurement allows us to compare objects by weight, or other attributes, without needing to bring the objects together. In this task you are using non-standard units, spoons. Non-standard refers to the unit not being generally accepted, like grams and kilograms are.

Units have important properties:

1. They contain the attribute we are interested in, i.e. spoons have weight
2. They are the same size, i.e. all dessert spoons are the same weight
3. They join together with no gaps or overlaps, i.e. dessert spoons add to the previous units, no weight is lost or added when more spoons are included.

This means that units of measure can be treated like other objects, which includes all the operations (addition, subtraction, multiplication and division). So collections of units can be added.



Look at what this person has made.

How did he make his measurement device?

How would you tell someone else how heavy the stapler is?

Make your own *Coat Hanger Balance*. You can use plastic bags to hold your objects if you need to.



Task One

Look around your house to find three objects to weigh. The objects should not be too big or heavy so items like small cans, tubes of toothpaste, small books and pencil cases are perfect.

- How heavy is each object in dessert spoons?
- What would happen to the measurement if you used teaspoons instead?
- Why would that happen?

Task Two

Use your results to predict the weight of two items together.

- Check using your *Coat Hanger Balance*.
- Are your predictions correct?

