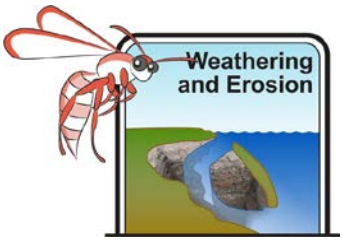


Design a Garden Bed – Student Activity

The school's veggie garden provided food for the canteen for many years, but now roots from surrounding trees have invaded the garden. The soil has compacted and lost its fertility.

Because it is important for people to learn how to grow food and improve soil, your class will plan how to construct a new raised garden bed. We will need to use all our STEM skills for the task.

Old water tanks can be used as frames for raised garden beds.

What do the letters STEM stand for? Write the word and how we might use that skill when planning to build a raised vegetable garden bed.

S

T

E

M

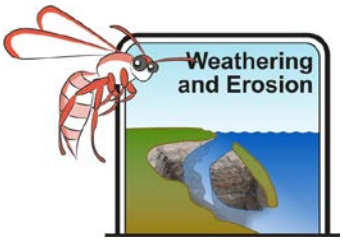
Safety First!

Lifting things so their base is above your belly button is unsafe. You can damage your bones and muscles and lose control of the load. However, holding heavy things at waist-height is easier and safer.

To lift a heavy object safely:

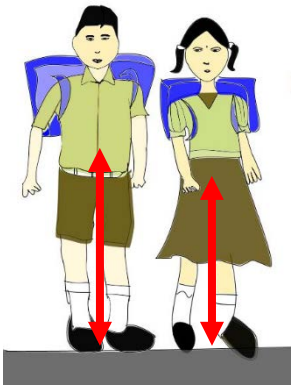
1. Do not try to lift by bending forward. Keep your back straight.
2. Bend your hips and knees to squat down beside the load.
3. Keep the load close to your body.
4. Straighten your legs to lift.

Avoid twisting and turning while carrying the load.



Design a Garden Bed – Student Activity

Task 1: Selecting the best height for the frame of the raised garden bed



Materials

- A tape measure (or several) on the classroom walls or door to measure the height of each person's waist above their feet.
- A calculator to estimate the average height of each person's belly button above the floor.

Method

1. Measure the distance from the floor to your waist and enter your reading on the board.
2. Look at the readings for the whole class and work out the maximum and minimum.
3. To calculate the average waist height of the class, add up all the readings and divide by the total by the number of students in the class.

Maximum reading _____

Minimum reading _____

Average reading _____

Discussion

We want the top of the raised vegetable bed to be easy to access so it is pleasant to tend the garden. If the garden container is too tall, it will be hard to reach the plants; if the container is too short, you would need to do a lot of bending over. Ideally, the top of the container should sit at about your waist. Why is this ideal?

_____

Critical thinking

Q1: Which measurement should we use as the maximum height of the raised garden bed frame? Would it be the maximum student waist height, the average student waist height or the minimum student waist height? Explain your answer.

_____

Q2: What can you do if the frame is taller than this ideal height?

_____

Q3: What can we do if the top of the frame is below average waist height?

_____

Design a Garden Bed – Student Activity

Task 2: Selecting the best shape for the raised garden bed frame

The walls of the frame need to be strong enough to contain the soil without bulging and collapsing. Some shapes are stronger than others. It is much easier and cheaper to test different designs using models, which are small versions of the real design. In this task, you will test which frame shape is stronger: a curved-corner wall (the left-hand picture above) or a square-cornered wall (the right-hand picture above).

Materials for each student or group:

- 1 sheet of scrap A4 paper
- Ruler
- Scissors
- Sticky tape
- Dry sand from the sandpit

Method

1. Cut two 10 cm wide strips lengthwise from the scrap A4 sheet.
2. Bend one strip round and use tape to stick the ends together to make a circular shape. This will be our curved wall model.
3. Fold the other strip so it has sharp corners and use tape to stick the ends together in a square. This will be our square wall model.
4. Visit the sandpit and place each frame on a flat piece of the sandpit. Gently push the walls into the sand so that the walls stand upright.
5. Evenly and gently add handfuls of sand into each frame in turn. Observe what happens to the paper frames as you fill them with sand.

Discussion

Collect data from the other groups. Which shape do you think will be better for a raised garden bed filled with soil?

Design a Garden Bed – Student Activity

Was this a “Fair test”? Why or why not?

_____

_____

How could this experiment be improved?

_____

_____

Look at the bend in the wall of raised garden bed pictured. What do you think caused this?

_____

_____

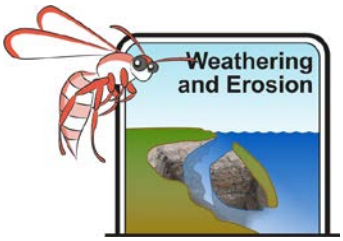
_____

STEM learning is supposed to improve your world. In this case, do you feel that STEM helped you learn something that you might use later in your life?

_____

_____

Design a Garden Bed – Student Activity



EXTENSION

Scientists have to be pragmatic. Pragmatism means we try to figure out what is the best option available. When we carefully consider our needs, the quality of materials, and their costs, we can often get a much better outcome than if we chose options without thinking.

Task 3: Choosing the best material for the raised bed

Some common materials for the structure of raised garden beds are straw bales, galvanized corrugated iron, and wood, like railway sleepers. What are some downsides of the materials listed? Which material do you think will hold up the longest?

_____

_____

_____

Task 4: Preparing the site

We know that the location of the old garden bed was good because it produced nice crops of vegetables before tree roots invaded and the soil was exhausted. You'd like to use the same location for the new garden bed. What should we do when building the new garden to prevent the same problems from happening again?

_____

_____

Task 5: Selecting material to fill the raised garden bed

We know that vegetables usually only grow in the top 10cm of the soil. Visit http://www.sgaonline.org.au/pdfs/factsheets/no%20dig.pdf and note down ways to inexpensively fill your raised garden bed with soil and organic matter.

_____

_____

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