Grade 5 Agriculture and Nutrition

Terms 1, 2 and 3 - notes for 13 topics

IN EVERY TOPIC

- What you will learn and the key words.
- Short, clear notes with worked examples.
- Questions to try and a topic test, with the answers at the back.

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Strand 1.0 Conservation of Resources | Term 1

1.1 Soil Conservation

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- identify sites for soil improvement in the school or community
- construct an organic waste pit for soil improvement
- demonstrate use of plant remains for soil improvement

KEY WORDS

soil improvement, organic waste, residue pit, compost, nutrients.

1. Identifying sites with poor soil

Signs of poor soil

Poor soil often looks pale or grey, feels hard and compact, grows only weak or stunted plants, and may be found where rubbish has been dumped or where the same crop has been grown for a long time without rest. Good soil is usually dark, crumbly, and supports healthy plant growth.

A good site for soil improvement is one showing these poor signs, that is also easy for the class to reach and safely work on regularly.

2. Why organic waste improves soil

Organic waste and soil

Organic waste, such as dry leaves, plant residue, and suitable kitchen food remains, breaks down over time and adds nutrients back into the soil, making it darker, crumblier, and better for growing crops. This natural process is why soil under a tree, covered in fallen leaves, is often richer than bare, exposed soil.

Not all waste is suitable - only organic (once-living) material breaks down this way; plastic and metal waste do not improve soil and should never be added.

3. Planning the organic waste pit

Planning the pit

A simple class organic waste pit needs a marked-out site (on the poor-soil area already identified), a reasonable size that the class can dig safely (for example, about half a metre deep and a metre across), and a plan for what will go into it: dry leaves, plant residue, and suitable food remains.

Planning before digging avoids wasted effort and makes sure everyone knows their role in the practical.

4. Constructing the organic waste pit

Practical: digging the pit

Materials: spade/jembe, marked site; small groups, teacher-supervised.

Under teacher supervision, mark the planned size on the ground, dig the pit to the planned depth, and add the organic waste (dry leaves, plant residue, suitable food remains) into it, mixing the layers.

Digging tools like spades are sharp and heavy - only one learner at a time digs, with others waiting a safe distance away, and a teacher supervises throughout.

5. Demonstrating plant remains for soil improvement

Practical: comparing soil

Materials: the constructed pit, a nearby untreated patch; small groups.

Set aside a small nearby patch of the same poor soil without adding any organic waste, as a comparison. Over the coming weeks, the class checks both patches, noting colour, texture (crumbly or hard), and any plant growth.

This comparison lets learners see the real, gradual effect of plant remains on improving soil, not just be told about it.

6. Checking and maintaining the pit

Maintaining the pit

A well-maintained pit needs occasional turning or mixing to help the waste break down evenly, and topping up with fresh organic waste as the old material decomposes and settles. Signs it is working well include a darker colour, a crumbly texture, and an earthy (not rotten) smell.

A pit that smells very bad or attracts too many flies may have too much wet food waste and too little dry material like leaves, and needs more dry leaves added to balance it.

7. Applying pit soil to a real planting site

Practical: using improved soil

Materials: the decomposed pit contents, seeds or seedlings; small groups.

Once the organic material in the pit has sufficiently decomposed (dark, crumbly, earthy-smelling), mix it into a small planting bed, and plant a fast-growing crop such as beans or vegetable seeds. Plant the same crop, at the same time, in an untreated bed for comparison.

Watering both beds equally and observing which grows faster and healthier is the real proof of whether the soil improvement worked.

8. Appreciating soil improvement

Why soil improvement matters

Improving soil through organic waste helps crops grow better, reduces the need for expensive artificial fertiliser, and puts organic waste to good use instead of it being thrown away. A community that improves its soil can produce more food from the same land.

This project also teaches a habit worth keeping for life: turning waste into something useful, rather than wasting it.

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TRY THESE

1. Name one sign of poor soil.
2. What does good soil usually look like?
3. What is organic waste?
4. Give one example of organic waste suitable for soil improvement.
5. Where should the organic waste pit be positioned?
6. Give a reasonable size for a class organic waste pit.
7. Why must only one learner dig with the spade at a time?
8. What goes into the pit after digging?
9. Why is an untreated comparison patch useful?
10. Name two things to observe when comparing the soil patches.
11. Give one way to maintain an organic waste pit.
12. Give one sign that the pit is working well.
13. How do you know the pit material is ready to use?
14. What should be planted to test the improved soil?

15. Give one benefit of improving soil with organic waste.
16. Why might using organic waste save a farmer money?

TOPIC TEST

T1. Describe one patch of soil near your home. Is it good or poor soil, and how do you know?
T2. Why do you think farmers sometimes deliberately leave crop stalks on a field after harvest instead of removing them all?
T3. Why might a pit that is too shallow not work as well as a properly sized one?
T4. Why is it important to keep the digging tool away from bystanders at all times, not just while actively digging?
T5. Predict what you think the pit soil will look like in one month, and explain why.
T6. Suggest a simple weekly schedule your class could use to check and maintain the pit all term.
T7. Why must everything except the soil type be kept the same between the two beds for this to be a fair test?
T8. Write one sentence encouraging your family to start improving soil with organic waste at home.

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Strand 1.0 Conservation of Resources | Term 1

1.2 Water Conservation

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- identify ways of conserving water for household gardening
- practise water conservation within the school or community

KEY WORDS

mulching, cover cropping, shading, moisture, conserve.

1. Why water conservation matters

Water conservation in gardening

Water is essential for growing crops, but it is not always plentiful - during dry seasons or drought, water can become scarce, making crops wilt and fail if not carefully managed. Conserving water means using it wisely so gardens can survive and thrive, even with less water.

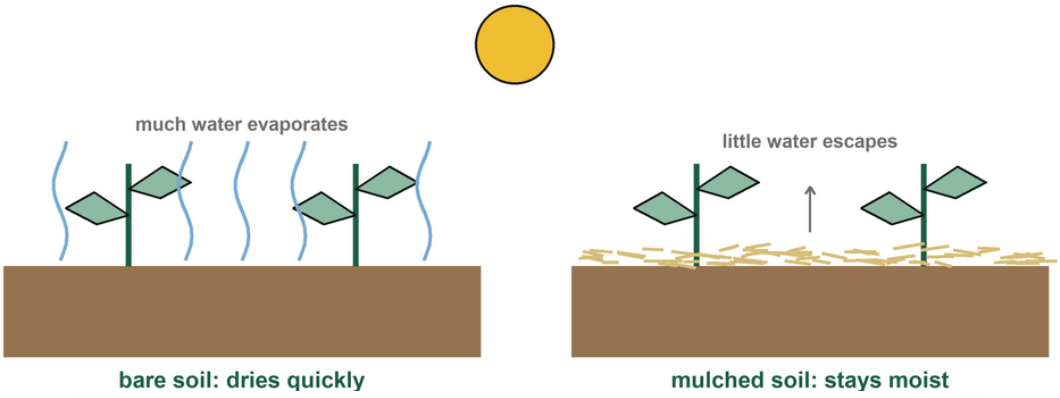
Simple conservation methods can make a real difference between a garden surviving a dry spell and one failing.

2. Mulching

Mulching

Mulching means covering the soil around plants with a layer of material such as dry grass, straw, or leaves. This layer reduces evaporation (water escaping into the air from the soil surface), keeping the soil moist for longer, and also helps control weeds.

Mulch acts like a blanket over the soil, shielding it from direct sun and wind, which are the main causes of soil drying out quickly.



Bare soil and mulched soil

3. Cover cropping and shading

Cover cropping and shading

Cover cropping means growing a fast-growing plant to cover bare soil between main crops, which protects the soil surface from the sun and reduces water loss, much like mulch does. Shading means using structures, like simple frames covered with cloth or leaves, to reduce direct sunlight on young or delicate plants, lowering the rate at which they lose water.

Both methods reduce how much the sun directly dries out the soil or the plant.

4. Practical: applying mulch

Practical: mulching a bed

Materials: dry grass/straw/leaves; small groups.

Spread a layer of dry grass, straw, or leaves around the base of plants in a garden bed, leaving a small gap right around the plant stem (to avoid rot), and covering the surrounding soil evenly to a depth of a few centimetres.

A layer too thin will not conserve much water; a layer piled directly against the stem can cause the plant to rot.

5. Practical: growing a cover crop

Practical: sowing a cover crop

Materials: fast-growing seeds; small groups.

Sow fast-growing seeds (such as beans or a leafy vegetable) between rows of the main crop or on bare soil, spacing them closely enough that they will grow to cover the ground fairly quickly, but not so closely that they compete too much for nutrients.

Water the newly sown seeds gently and regularly until they establish.

6. Practical: constructing a simple shade

Practical: building a shade structure

Materials: sticks, cloth or leaves; small groups.

Build a simple frame using sticks arranged over a planting bed, and cover it loosely with cloth or leafy branches, high enough that it does not crush the plants but low enough to actually block strong midday sun.

A shade should allow some light through - blocking all light would prevent the plants from growing properly.

7. Experimenting: comparing mulched and unmulched soil

Practical: the mulching experiment

Materials: two similar beds, one mulched, one not; small groups.

Set up two similar beds, mulch one and leave the other bare, water both equally at the start, and then avoid watering either for a few days. Check the soil moisture in both by feel (or by digging a small hole and observing) each day, and record the results.

This experiment gives real, direct evidence of how much mulch actually helps conserve water, rather than just being told it does.

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8. Sharing experiences on water conservation

Practical: presenting findings

Materials: notes and results from previous lessons; small groups.

In groups, prepare a short presentation summarising what was tried (mulching, cover cropping, shading), what was observed, and which method seemed most effective for conserving water in the class garden.

Sharing findings with the whole class helps everyone learn from what different groups discovered, even if their exact results differed slightly.

9. Appreciating water conservation in the community

Water conservation and the community

When many households and farms conserve water, the whole community is better prepared for dry seasons, food production is more reliable, and shared water sources, like wells, rivers or dams, last longer for everyone to use.

Water conservation is not just a garden trick - it is a habit that protects a community's food security and water supply for the future.

TRY THESE

1. Why is water essential for gardening?
2. When might water become scarce?
3. What is mulching?
4. How does mulch help conserve water?
5. What is cover cropping?
6. How does cover cropping help conserve water?
7. What materials can be used to mulch a bed?
8. Why should mulch be kept a small gap away from the plant stem?
9. Give an example of a suitable cover crop plant.
10. Where should a cover crop be sown?
11. What materials are used to build a simple shade?
12. Why should the shade not be too low?
13. What is the only difference between the two beds in this experiment?
14. How can soil moisture be checked?
15. Name the three water conservation methods covered in this sub-strand.
16. What should a group's presentation include?
17. Give one benefit to the whole community when many households conserve water.
18. Name one shared water source that benefits from community-wide conservation.

TOPIC TEST

T1. Describe a real time you or your family had to use water carefully. What did you do?
T2. Why might mulch also help control weeds, in addition to conserving water?
T3. Why might a farmer choose shading over cover cropping for very young, delicate seedlings?
T4. Why might mulch that is too thick also cause problems for a plant?
T5. Why does gentle watering matter more for newly sown seeds than for an established plant?
T6. Why might a farmer remove the shade once plants are more established?
T7. What might happen to your results if it rained partway through the experiment?
T8. Suggest a fourth water conservation method, not covered in class, that you have heard of or can think of.
T9. Suggest one way your family could conserve more water at home, beyond gardening.