

# SUNFLOWER GROWING COMPETITION - 2023



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## Sunflower Growing Competition

**Dear Colleague,**

Thank you for taking the opportunity to participate in this year's 'Sunflower Growing Competition'.

Learning about plants, growing them from seed and appreciating the importance of plants in the environment is very important. Learning to respect plants and understanding why we need them is fundamental to encourage young people to look after our flora and the wildlife they support.

The competition is therefore secondary to the learning experience and is meant to add an element of fun. It is hoped that you enjoy being involved and that you get interesting results from your students' efforts.



# Sunflower Growing Competition

## **Aim of the Project**

The competition is geared towards meeting those needs of Primary and Secondary science units detailed in the National Curriculum. However, growing plants can be linked to many other curriculum subjects.

As the competition is based on the life cycle of the plant students will need to be at the same school after the summer holiday period which is when the sunflower heads are harvested and weighed.

## **The Competition**

Pupils will compete to produce the “heaviest sunflower head” grown from the materials supplied. Entry is limited to one sunflower head per pupil.

As stated above the competition is designed to follow the life cycle of the sunflower. It will therefore be necessary for the students to take their plants home and grow them on over the summer holidays.

## **Judging**

In order to have the flower heads weighed, pupils (or staff) will be required to weigh their sunflower heads and send photographic evidence to [growyourowngrub@leicester.gov.uk](mailto:growyourowngrub@leicester.gov.uk) between 1 October and 31 October 2023. The winning school will be notified after the October break.

The harvesting of the sunflower heads is described later in this booklet.

## **Prizes**

There will be first, second and third place prizes for students and schools. Prizes will be awarded after the October break.

## **Publicity**

Publicising the competition is important to promote the hard work of the schools and the students involved. Some of you may be contacted at any time over the period of the competition to see if you are willing to participate in any publicity, this is likely to be through the local press and it is not mandatory.

The awarding of the prizes in October generates public interest and if your school is presented with the trophy you are encouraged to take part in publicity.



## Sunflower Growing Competition

### **Timetable**

You will find an outline of the timetable for the competition at the back of this booklet marked up with some key stages over the year. To ensure the smooth running of the competition, please try to keep to the timetable and check it from time to time to be sure you know what is expected of you and your students.

### **Any questions?**

Should you have any questions concerning any aspect of this competition please do not hesitate to contact us on [GrowYourOwnGrub@leicester.gov.uk](mailto:GrowYourOwnGrub@leicester.gov.uk)

- Molly Laycock, Project Officer, Leicester City Council
- Kay Thompson, Let's Get Growing Senior Project Officer, TCV
- Daxa Ralhan, Programme Officer, Leicester City Council

### **Good luck!**

The best of luck to you all, and we hope you and your students enjoy the experience and find the competition fun and worthwhile.



## Sunflower Growing Competition

### **Materials**

The sunflower seeds will be distributed to the schools just after the Easter break. It is **not** advisable to plant the seeds **earlier than** Easter as the seedlings will need looking after during the early stages of development.


There is enough material for each student to have two attempts, however seed viability varies and not every seed will germinate. This means that using the material provided each student should have at least one sunflower to take home. You may choose to grow additional plants in the school garden.

### Mini-Greenhouse (optional)

You may also consider allowing your students to make their own mini-greenhouse out of plastic juice bottles. Not only does creating a mini-greenhouse from bottles encourage an element of recycling – it also allows some discussion around the mini-greenhouse representing the Earth and the environment inside representing the greenhouse effect.

By creating a mini-greenhouse, not only does it assist with re-cycling - it also allows the students a method of transporting the seedling(s) home.

### Seeds

 The seed company may chemically treat the seed. Avoid breathing the dust and wash your hands after handling the seed. You may wish to soak all seed in water overnight before planting them.

### **Growing Sunflowers**

Many of you will be used to growing plants from seeds so growing sunflowers should not prove difficult. Hopefully what follows will be common sense. For the best results please read the instructions carefully.

Many students find growing something from seed highly rewarding and this should be encouraged so that they can fully engage with the learning experience.

Once germinated, the students will have to take the plants home to grow them on through the Spring and Summer. However, we recognise that all the students may not have a garden area available. These students will be able to grow the sunflowers in either containers (pots) or grow bags. Sunflowers grown in this way will need a lot more care and attention. They will require water and feeding along with a good support system to prevent the plants from falling over when they become taller.



## Sunflower Growing Competition

 **Please read the Health and Safety Risk Assessment before continuing**

### HEALTH AND SAFETY RISK ASSESSMENT

**Please read through before taking part**

#### Background

It is well known that sunflower seeds are edible and used in the manufacture of oils and margarine as well as included in numerous food products. However, it must be noted that various parts of the sunflower may cause a reaction in particularly sensitive individuals.

ALTHOUGH THE LEVELS OF RISK ARE LOW AND SHOULD NOT BE CAUSE FOR ALARM, THE FOLLOWING INFORMATION IS GIVEN SO YOU ARE ADVISED OF ANY RISKS ASSOCIATED WITH SUNFLOWERS SO YOU CAN ADVISE THE STUDENTS ACCORDINGLY.

Most students will have eaten or used products containing sunflowers and may already be aware of their sensitivity to them. **You should check to make sure you know if you have any students that have a reaction to sunflowers or sunflower products before asking them to take part.**

The two main issues relate to ingestion of sunflower seeds and touching the plant.

#### Ingestion

It is impossible to tell who is allergic to any food item where they have not been introduced to it before, however those who already suffer from an allergy to one type may indeed have an allergic reaction to other types. New exposure to a food type may induce an allergic reaction. To virtually every food type there is someone allergic to it. Two types of reaction are oral allergy syndrome and anaphylactic reactions.

Oral Allergy Syndrome is an allergy to certain proteins in raw fruits, vegetables, seeds, spices and nuts causing allergic reactions in the mouth and throat. These allergic reactions happen mostly in people with hay fever (pollen allergies) and may occur on ingestion of sunflower seeds. In most cases Oral Allergy Syndrome does not require medical treatment.

Symptoms may include itching and burning of the lips, mouth and throat, watery itchy eyes, runny nose and sneezing. Some individuals report that peeling or touching the offending foods may result in a rash, itching or swelling where the juice touches the skin. More serious reactions can include hives and swelling of the mouth, pharynx and windpipe. In rare cases, severe allergic reactions have been reported such as vomiting and diarrhoea, bronchial asthma, generalized hives and anaphylactic shock. Symptoms usually develop within minutes of consuming or touching the food, but occasionally occur more than an hour later.





## Sunflower Growing Competition

Reportedly anaphylactic reactions have been elicited after ingestion of sunflower seeds, (as well as sunflower oil and honey containing sunflower pollen). This can be potentially life threatening.

Symptoms may include sneezing, blocking, watering and runny nose (rhinitis), swelling and itching of the throat and vocal chords leading to obstruction of breathing, blue lips indicating oxygen deficiency, dry hacking cough, wheezing, tingling and itching lips, swelling of lips, palate and tongue, asthma, shortness of breath, itching rash, hives (urticaria), swelling (angioedema), flushing, chest pain, a fall in blood pressure and collapse, loss of consciousness - anaphylactic shock, colicky abdominal cramps, vomiting, nausea, diarrhoea, faecal or urinary incontinence.

**ACTION!** Children should not be encouraged to eat sunflower kernels. Where children are known to suffer from sunflower anaphylaxis they should not eat sunflower products.

**RISK** The levels of risk are VERY low

### **Touching**

Chemicals called 'sesquiterpene lactones' occur in the glandular hairs of sunflowers (on leaves and the stem). These substances are considered to be capable of inducing allergic contact dermatitis in sensitised individuals.

An allergic skin response may not occur immediately after coming in contact with an allergen. It may take one to three days before the skin reacts and becomes red, itchy and inflamed. Although the area that was exposed to the allergen is usually the most severe, reactions may also occur elsewhere on the body.

**ACTION!** Children should be encouraged to wash their hands after touching sunflowers. Anyone sensitive to plants should wear gloves if necessary.

**RISK** The levels of risk are VERY low







## Sunflower Growing Competition

### **Setting up using a cup**

Place compost in a small pot, cup or container and make a small hole in the top with a pencil, about 1 centimetre deep. Put in one sunflower seed and gently push the compost together to close the hole. By planting one seed per pot there is no competition between seedlings, and this should make growing the sunflower easier.

So that the pots can be identified, students can label their pots using small flags made from cocktail sticks (not provided) or draw a labelled map of the pots in the tray.

After 7-10 days the sunflowers will start to grow. Not all seeds will germinate, and some will germinate faster than others.

The pots will then need water each day. Do this by putting water into the bottom of the tray. The water will be soaked up by the pots and will help the sunflowers to grow.

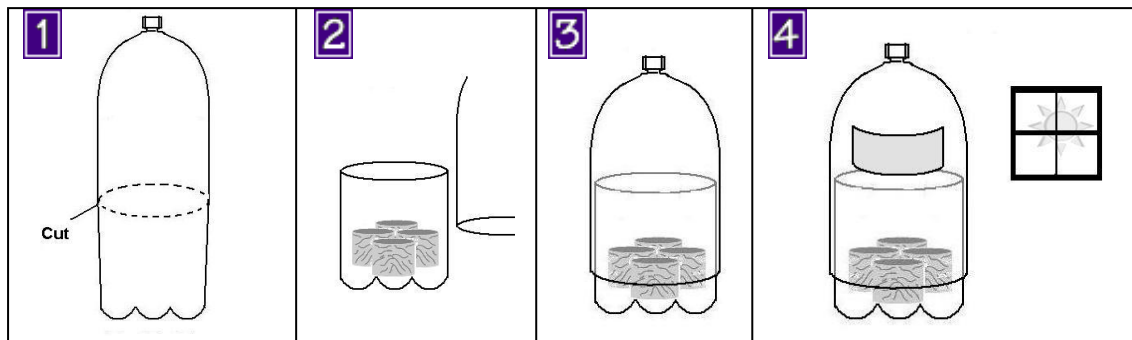


## Sunflower Growing Competition

### Setting up a mini-greenhouse

There are different ways you can create a mini-greenhouse. The easiest way is to use a smooth sided plastic 1.5 or 2-litre juice bottle. Each bottle should easily support between 2 to 4 pots. Smaller 500 millilitre bottles can be used and would support a single pot.

Ask your students to bring to school an empty plastic juice bottle with the label removed. The bottle should be rinsed thoroughly before use.



**1** Arrange to cut below mid height of the bottle all the way around using sharp scissors or preferably a sharp craft knife. Remove the lid to make cutting easier. Replace lid once cut is complete.



Sharp scissors or craft knives can leave a ragged cut edge on the bottle that may scratch fingers and hands. Care should be taken at all times.

**2** Carefully place the pots with the planted seeds on the bottom portion of the bottle and add a little water, as the pots should still be moist after planting.

**3** Place the top part of the bottle back on, overlapping the base or vice versa depending on the shape of the bottle, to create a snug fit.

**4** Add a label and place somewhere light but not in direct sunlight. Frequently check that the mini-greenhouse has not begun to dry out. After about a week the seedlings should appear, then remove the cap and keep moist. The mini-greenhouse can be used to let the students carry their sunflowers home.

Keep an eye on the mini-greenhouses. They should mist up a little. If there is too much moisture you can remove the cap of the bottle and let some evaporate naturally and replace the cap once the sides are clear. Make sure the pots do not dry out.

### Potting on

As the seedlings continue to grow, you will notice roots appearing around the edge. This is an indication that the plant is ready for “potting on”. This is the process of moving the seedling into a bigger pot. The additional compost will provide extra food and water for the young plant to continue to grow.



## Sunflower Growing Competition

You can use a variety of recycled containers to pot your seedlings into. Yogurt pots, plastic cups and pop bottles (cut in half) all make ideal plant pots. However, you must ensure that you make a few drainage holes in the bottom of your containers first. An alternative is to make origami pots using old newspaper. Full video instructions can be found on YouTube at the following website:

[http://youtu.be/\\_gTyAmH1LAK](http://youtu.be/_gTyAmH1LAK)

### **Acclimatisation**

When the sunflowers have a set of four leaves they need to be “Hardened-off”. This is the process of making the plants used to the weather outside. This can be done by putting them outside in the day and bringing them back inside at night. After two weeks the sunflowers can then be taken home and planted in the garden. Take care not to damage the small stems and leaves otherwise the sunflower may not survive.



## Sunflower Growing Competition

### Planting your sunflower seedlings

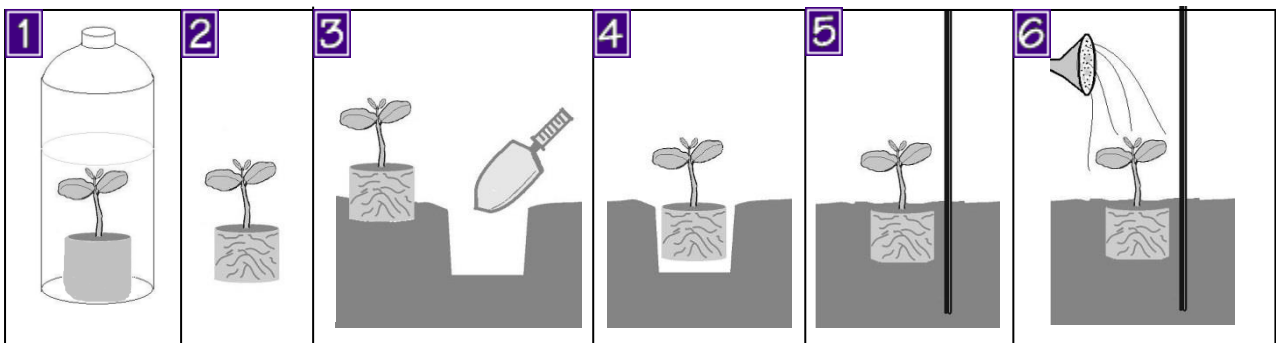
Well done, you have successfully grown your sunflower from seed and can now take it home.

#### Choosing somewhere to plant your sunflower

Choose where you want to plant the sunflower in your garden. Sunflowers will grow in almost any type of soil. Once you have chosen somewhere, ask your parent or guardian if it is suitable place. If you do not have a large enough garden or space in your own garden to plant the sunflower, you may be able to ask a relative if you can plant it in their garden.

#### Plant your seedling

Once you have picked a spot, you are ready to plant the seedling.



- 1** Take care in moving your seedling. Keep it in your protective wrapping or mini-greenhouse until you are ready to plant it.
- 2** Carefully take it out of any wrapping or your mini-greenhouse you used to bring it home. Make sure your seedling is still in one piece.
- 3** Use a trowel to dig a hole a bit bigger than the size of the pot.
- 4** Sit the seedling into the hole and make sure that the surface of the compost is in line with the surface of the soil around it. Gently put some of the soil back around the plant and press it down with your fingers. To stop the plant from drying out, cover with about one centimetre of soil but be careful not to damage the sunflower.
- 5** Your seedling will grow tall and will require support. You can do this by pushing in a stake close to the plant but not through the pot. Tie the sunflower to the stake as it grows making sure you do not tie it too tight otherwise you could damage the sunflower and stop it from growing.
- 6** Do not forget to water your seedling after you have planted it.



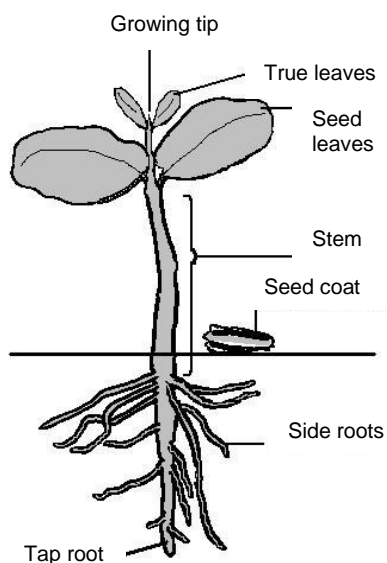
## Sunflower Growing Competition

### Teachers Guide to Student Activity Sheets

#### Answers to Student Activity Sheet 1

2:

#### Notes



During seed germination, the tap root (also known as the radicle) emerges first before the hypocotyl (also known as the plumule). The hypocotyl grows and becomes the stem with leaves. The tap root grows downwards in response to gravity and the hypocotyl grows upwards in response to light.

There will be two cotyledons or seed leaves on the sunflower. This categorises sunflowers as dicotyledons. Grass is an example of a monocotyledon as it only has a single seed leaf upon germination.

The protective seed coat will drop off as the cotyledons mature. The seed coat protects the kernel inside. The kernel is made up of the embryo and food store for the seed.

Care should be taken to prevent damage to the apical shoot, as this will severely affect the growth of the sunflower.

3 and 4:

These questions relate to the process called 'photosynthesis'.

The three basic components required by plants are 1) Carbon dioxide that enters the leaf through stomata in the lower side of the leaf. 2) Water taken up by the roots and 3) Energy from the Sun.

During photosynthesis the green pigment, chlorophyll, in the leaf cells trap energy from sunlight. Chlorophyll converts raw materials, carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O), into the sugar glucose (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>). The chlorophyll releases oxygen (O<sub>2</sub>) that leaves the leaf through the stomata into the atmosphere as a by-product. Plants use sugar to provide the energy for growth, repair and reproduction.



## Sunflower Growing Competition

Chemically photosynthesis is the opposite of respiration – the process that occurs when we breathe. During respiration, cells release energy by converting sugars and oxygen into water and carbon dioxide. Plants respire too, mainly at night when sunlight is not available.

### **Points for Discussion**

How many seeds have germinated after 1, 2 and 3 days etc? What affects germination? Consider what a plant needs to grow. Calculate the percentage germination for each day.

How can you tell which is the radicle (root) and which is the plumule (shoot) and which appears first, the radicle or the plumule? (The radicle will appear first)

Measure the plumule as it grows. Design a suitable way of displaying the data collected. How fast does the sunflower grow?

What is a tropism? Consider different ways of investigating tropisms.

How does the mini-greenhouse compare with the Earth? The plastic bottle acts as a shield trapping the sun's energy, heating up the air much like the Earth's atmosphere.

### **Student Activity Sheets 2 and 3**

Activity sheet 2 can be handed to the students and worked through after the seeds are planted to review progress. Activity sheet 3 can be handed to students when the sunflower seedlings are ready to go home. You may wish petals for dyeing as well as pressing the seeds to make hair oil.





## Sunflower Growing Competition

### **Vocabulary**

Chlorophyll	A green substance that gives leaves their colour. Chlorophyll absorbs energy from sunlight that a plant uses to make food.
Chloroplast	A plastid that contains chlorophyll and is the site where photosynthesis and starch formation occur.
Cytoplasm	The fluid surrounds the nucleus and other organelles inside the cell.
Photosynthesis	The formation of carbohydrates in the chlorophyll-containing tissues of plants exposed to light.
Plastid	Any of various small particles in the cytoplasm of the cells of plants containing pigments, starch, oil or protein.
Stomata	A very small hole in the surface of a leaf, usually on the lower side. Oxygen and carbon dioxide from the air enter through the stomata; oxygen, carbon dioxide and water vapour leave through the stomata.
Tropism	The turning or bending movement of an organism or a part toward or away from an external stimulus, such as light, (heat, or gravity).





# Sunflower Growing Competition

APRIL/MAY



Seeds delivered to school



Seed sowing

MAY

Potting on

Germination

JUNE

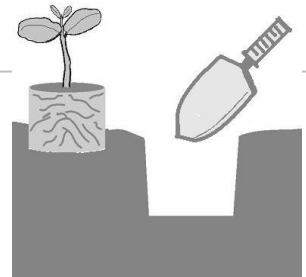
Take home



Acclimatisation (Hardening-off)

JULY

Plant out



AUGUST

Grow on



SEPTEMBER

OCTOBER

"WEIGH-IN"

Harvest

NOVEMBER



Award Prizes