You will find detailed steps for each section of the RHS Amazing Seeds Activity on the follow pages. Use the Amazing Seeds Activity Overview Notes as a guide.

Activity Name 1.0 Introduction/starter	2 minutes

Learning Objective(s)

- To highlight jobs available in the STEM sector
- To get learners interested in STEM subjects
- To develop rapport with the learners for the Amazing Seeds session
- To introduce seeds!

Overview

An opportunity to talk **very** briefly about what you do and why it's an interesting job. Tell the children why you like plants and what it is about the science of plants and seeds in particular, that you find fascinating. Name your favourite plant and tell the children why you like it.

You will need

- Slide 1
- An interesting seed (such as a coconut, avocado or an exotic seed)

Preparation

Add your name to the slide (delete the stars), add your favourite plant to the slide(delete the stars)

Description / steps

[The mouse clicks will reveal each detail]

1. [Introduce yourself and tell the children what you do (or did) for a job].
2. [Name your favourite plant and tell the children why you like it].
3. [Hold up your seed and introduce it. Tell the children why you like plants, seeds and the science behind them].
4. [Tell them]
   I'm going to spend the next half an hour showing you why seeds are exciting and amazing!

Activity Name **1.1 Let's look at seeds**	5 minutes

Learning Objective(s)

- To look for similarities and differences in seeds
- To notice patterns in the structure of fruits that relate to how the seeds are dispersed
- To know that the seeds have come from plants

Overview

Pupils will participate in an odd one out discussion looking for similarities and differences. They will be encouraged to be curious and ask questions about what they notice.

You will need

- Printed sheet 1.1 Amazing Seeds Odd One Out worksheet one or two
- ***Or*** slide 2 or 3

Preparation

Before the Amazing Seeds activity it would be great (but not essential) if the pupils could have looked at a range of seeds with their teacher, from tiny ones, to seeds as large as possible (this could be store cupboard ingredients such as poppy seeds, coriander, fennel seeds, peas and a coconut).

Prior to the session choose to use either slide 2 or 3 (delete the unwanted slide) and the associated printed resource page (1.1 Amazing Seeds Odd One Out worksheet one or two).

Description / steps

1. [Ask the teacher to help organise the pupils into small groups, this might be at group tables in a classroom].
2. [Show the images on the presentation slide no. 2 or 3, and give out the printed resource page, 1 sheet per group].
3. [Speaking to the whole class] In your groups I want you to try to come up with 2 things that are similar and 2 things that are different about the pictures.
   [If they get stuck, prompt them to think about the following]
   - Appearance
   - What they do
   - Where they might be found
4. [Each group decide which picture is the odd one out and why. Encourage a reason for every answer and there is no wrong answer!]
5. [Ask 2 groups to give you their answers] Can you give us your group's answer – don't worry there can be lots of correct answers!
6. [When 2 groups have given their answers, ask the class]. Have you ever seen these plants and do you know what they are called? They are all pictures of seeds and that they have all come from plants.

   [From left to right on **slide 2**]: This is a **Dandelion** seed head – the seeds are blown by the wind on mini parachutes. Have you ever blown the seeds away from a dandelion? This is a seed from a **Maple tree**. The winged seed spin to the ground. These are **Blackberries** they are eaten by birds and animals and me!

   [From left to right on **slide 3**]: These are **conkers** inside their spiny coats, they're heavy and when they drop to the ground they roll. The coat splits open and then you can see the shiny brown seeds which are the conkers, inside. This is an **apple** and the seeds are inside. Apples roll when they fall off the tree, they are eaten by birds and animals and me! The tiny seeds of **poppies** are inside these round parts at the end of the

long stems. The wind blows the long stems and the tiny seeds shake out through holes – a bit like shaking pepper or salt!

Activity Name **1.2 Dead or alive?**	15 minutes

Learning Objective(s)

- To recognise that plants have the same life processes as humans that make them 'alive'.
- To explore and compare the differences between things that are living, dead, and things that have never been alive by sorting out objects.
- To find out what is special inside a seed that gives the potential for life and growth.

Overview

Pupils will participate in a sorting activity to look at what it means for humans to be alive by noticing that we breathe, move, grow, feel, eat and have babies and recognise that plants are also alive. They will look inside germinating pea seeds and see that something that appears dead actually contains a life waiting to happen, complete with a food store.

<u>Prepare a week in advance</u> – Soaked pea seeds

You will need:

- Recycled plastic food trays work well for this activity
- Cotton wool or compost
- Dried peas (supermarket, marrowfat varieties that are sold for eating)
- Water

1. Make holes for drainage in the plastic tray
2. Put dried peas in a cup and cover with cold water and soak for 12 hours (approx.)
3. Place compost or a layer of cotton wool into the plastic tray
4. Pour water onto the cotton wool or compost to make it wet all over – allow excess water to drain off
5. Spread soaked peas onto the wet cotton wool or compost (no need to cover the seeds). Keep the cotton wool or compost moist
6. Peas should start to germinate (grow a root, then shoot) after about 4 days

For the activity you will need:

- A printed photo of yourself
- Presentation slides 4-7
- Trays of objects to sort (enough for each table/small group of pupils) - stones, leaves, seeds (including dried peas), twigs
- Trays of soaked, peas that have started to grow a root and a shoot (as above preparation)

Preparation

Put out trays of objects to sort on tables before starting the Amazing Seeds activity
Have soaked, germinating pea seeds ready to give out (enough for each table/ small group of pupils)
A photograph of yourself

Description / steps

1. [Hold up a photo of yourself]
2. [Ask the following questions] What's the difference between a picture of me and me standing here? [Wait for responses]. How do we know which one is the real me and which one is the picture? How do we know I am alive?
3. [Show **slide 4** but don't click the mouse that will reveal the life processes].
4. [Ask the pupils to]: hold a hand in front of your face can you feel your own breath?
5. [Look at slide 4 - the illustration of the plant and a person – and ask the question]:

What can a plant do that we can do? [Show the text box and read it out]: breathe, move, feel, eat, and have babies.

6. [Show **slide 5** and read the following]

   Seedlings grow towards the light and you can see they have gotten bigger. Daisies open their white petals in dry weather and close them up tight if it is raining – have a look at daisies in your local park or garden (or on the school field) to see if this is true.
   So, although we don't see them do it plants do move. They also take in the air a bit like breathing, take food from the soil and make seeds – a lot like when people have babies.

7. [Ask the pupils to look at the objects in the trays and sort them into three piles – **alive**, **was once alive** and one for **was never alive**. Give time for sorting and circulate around the groups].
8. [Ask the question].Which pile should seeds go into? Let's find out.

9. [Give out the trays of soaked pea seeds and give time for the pupils to look closely and see where the shoots and roots have come out of the seeds].

10. [Look at **slide 6** and point to the pictures as you read]:

    Peas grow inside the pea pods, if you open them up when they are green the peas are delicious to eat. If you let the pea pods go yellow and dry out you can collect the seeds, which are the dried peas. You can plant them in the ground or put them on wet cotton wool and get them to grow. The water wakes them up. It makes a root start to grow and then a shoot. Inside the dry seed there is food packed in for the tiny seedling (a bit like a packed lunch). It uses this to give it energy to grow.

11. [Look at **slide 7** and ask]
    Are seeds dead or alive? What could grow from these seeds?
    From left to right: An oak tree, a hazelnut tree, a sunflower, a runner bean plant and a broad bean plant.

    [Click the mouse again to reveal the next pictures and read]

    Sometimes plants make seeds that can wait in the ground until the season and weather is good for them to grow. This is one way plants have adapted to survive very cold weather.
    From left to right: Sweet peas, nasturtiums and sunflowers can do this.

Activity Name 2.0 Seeds leave home in different ways	5 minutes

Learning Objective(s)

- Identify and name common wild plants, including deciduous and evergreen trees
- Experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them.
- Explore **seed dispersal.**

Overview

Images on **slide 8** and a short video on **slide 9** will give the opportunity for learners to not only think about and observe how seeds 'leave home' but also think about why it is important for them to do so. They will be encouraged to be curious and ask questions about what they notice.

You will need

- Slide 8 & 9
- Scissors
- Paperclips (enough for one each)
- Clothes pegs

Nice to have to show whilst talking about them (any or all of the following)

Pine cones, acorns, hazelnuts and conkers

Preparation

Put out scissors, paperclips and clothes pegs – out of reach, but ready on tables for the next activity (2.1 make a seed spinner).

Description / steps

1. [Show **slide 8** of a dandelion head, acorns and conkers (horse chestnut seeds) and read the title] Seeds leave home in different ways.
2. [Ask the questions] Can any of you tell us what I mean when I say that seeds are 'leaving home'? [wait for responses] Why don't they just stay where they are? [wait for responses]
3. [Ask each small group of learners] Can one of you tell us just one fact about one of the pictures? This could be the name of the plant/tree/seed/ or how it leaves home [wait for responses].
4. [If the learners don't come up with answers, read the following text]:

Seeds need to move away from their parents. The parents are the plant or tree that made the seeds (from their flowers). If the seeds don't do this they can't grow. If they don't move far away, they won't have enough room to grow and they'll be getting in the way of their parents. They'll be competing for water, light and food.

The seeds leave home in many different ways.

Each dandelion seed has its own parachute to help it float on the breeze. Have you ever picked a dandelion and blown the seeds away?

Acorns and conkers are heavy seeds and they drop to the ground and roll to a new home, or sometimes get collected and hidden by birds and animals like squirrels.

5. [Show **slide 9**] We're going to watch a very short video and I want you to find out how the seeds leave home and what they look like? [Press play and watch for a minute You could talk over the video if wanted, perhaps to talk about where the seeds might want to land (in soil) and compare to where they do land (on tarmac / concrete) and what might happen to after that (the wind might lift them).

6. [Ask the children to stand up]. Stay in your place and move like the seeds in the video. What is moving like this called? [Spinning]. What is the name of the tree that the seeds have come from? [Maple or maybe Sycamore]. What flying machine does it remind you of? [Wait for responses].

7. [Read the following]:

   Maple seeds are stuck to a special 'wing' that spins as the seed falls and this is how it moves away from the tree, a bit like a helicopter blade. Pine seeds fall out of pine cones and do the same thing. Ash, sycamore and lime seeds all have a type of 'sail' or 'wing' to spin or glide them to a new home. This is called **seed dispersal** using the wind.

Activity Name 2.1 Make a seed spinner	15 minutes

Learning Objective(s)

- To look for rational explanations and ***develop a sense of excitement and curiosity about natural phenomena.***
- To engage in a scientific investigation where they are pattern seeking and think about how they could use comparative and fair testing to find answers.

Overview

Having previously watched a video of Maple seeds spinning to the ground from trees, pupils will make their own paper seed spinner by cutting up and folding paper. They will use paperclips and/or clothes pegs as a weight to represent a seed. They have the opportunity to test out their seed spinner creations. Pupils will be encouraged to be curious and ask questions about what they notice.

You will need

- 2.1 Make a seed spinner worksheet, printed onto A4 paper (enough for one between two as each sheet has two seed spinners; cut the sheets in half. Ensure you have a demo copy for yourself and extras to cover mistakes that could be made)
- A completed 'seed spinner' with paperclip attached
- Scissors (enough for a pair per learner)
- Paperclips (enough for at least one each)
- Clothes pegs
- Sticky tape to correct mistakes

Preparation

Check that pupil have materials ready to use on their tables and give out half a 2.1 Make a seed spinner worksheet, to each.

Description / steps

1. Ensure everyone is looking at you and <u>not</u> touching scissors, paperclips, pegs or their worksheet:
   I want you to watch me <u>first</u> before you start to make your own seed spinner and you won't need anything in your hands while you are watching!
2. Explain whilst doing a demo. Point to the dotted lines on the worksheet: *I am <u>not</u> going to cut on the dotted lines, so I'll keep my scissors away from them!*
3. Point to the black lines on the worksheet: *I <u>am</u> going to cut on the black lines*.
4. Cut out a seed spinner in front of the learners. Cut around the outside first on the black lines, then make two cuts up to the dotted line: *Put your name on your seed spinner*!
5. Hold the cut out spinner in front of you, facing the class and demonstrate how to fold one wing towards and the other away from you. Attach a paperclip.
6. Throw the seed spinner in the air to show how it works.
7. For safety reasons explain the following:
   Everyone will need to stay in their seat until they have cut out, named, folded the wings and attached a paper clip to their seed spinner
   For safety reasons - ensure everyone is sat down to use scissors
8. Give time for the class to test the seed spinners individually and encourage them to try with more than one paperclip and also with a peg.
9. Test the seed spinners as a whole class and ask the pupils to look for reasons why some work better than others. Ask for suggestions. How we could make it a fairer test?

Activity Name **2.2 What have we found out?**	3 minutes

Learning Objective(s)

- To gauge how much the children remember from the Amazing Seeds activity.
- An opportunity for the class teacher to observe if new vocabulary is being used.

Overview

A chance for them to recount their new knowledge, be curious and ask questions about what they have noticed. Build a sense of excitement and curiosity about natural phenomena and what they could look to experiment with next.

You will need

- Slides 10, 11 &12

Description / steps

Ask the children to return to their seats

1. [Show **slide 10.** Each point is revealed on a mouse click].
2. [Can the children tell you what they've found out by you giving them the following clues?]
    - Tell me something **very special about seeds**
    - Tell me something about how plants can **survive** very cold weather
    - Tell me something about **how seeds can move**
3. **Slide 11** [read out the text]
   Some seeds are exploded out of their seed cases and fired away from the plant! Watch the video, what is happening? What sort of plant is it?
   [For your information: This is the introduction to the next investigation they could do with their class teacher – looking at another means of dispersal – propulsion].
4. **Slide 12** [play the video showing exploding sweet peas and repeat if time so that the children can see what is happening].
5. **Slide 13 [**read out the challenge] Can you create a device to fire seeds a long distance?
   [For your information: you can leave the class and teacher with this challenge to take on if they choose to].

****Session Ends****