



UKRI GCRF  
action  
against  
stunting

# The Road to Zero Hunger

TEACHER'S  
GUIDE



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# Introduction

The Road to Zero Hunger provides an exciting opportunity for pupils aged 8-14 years to engage with *Action Against Stunting* (AAS), an international research project. According to the World Health Organisation, stunting is a problem that affects 162 million children worldwide.

The Road to Zero Hunger introduces your pupils to the AAS project through a role play activity. In role as farmers, parents, health workers and researchers, the pupils share facts about their lives including their concerns about child stunting. The activities that follow enable pupils to explore areas of the AAS project including the impact of diet and access to local markets to buy fresh produce.

The pupils learning culminates with a challenge to apply their research and STEM skills to solve a problem experienced by many farmers: that of how to package, then transport their fresh and nutritious produce from the farm to local markets using affordable transport.

For older and/or more able children you can increase the difficulty of the challenge by including the need to protect produce from the heat and rain.

If you would like to know more about the AAS project visit [actionagainststunting.org](http://actionagainststunting.org)

## Using this pack

The materials within this pack have been designed to be used flexibly by teachers, home educators, youth leaders etc.

Many of the activities enable coverage of parts of the National Curriculum for KS2 and KS3 Science and Design and Technology for England. For details, see page 10. A list of cross curricular suggestions can also be found on page 11.

The resources can also be used for outdoor learning, for a transition project between primary and secondary aged pupils, and/or for STEM (Science, Technology, Engineering and Maths) enrichment days and clubs.

Pupils taking part in the project are also eligible to gain a British Science Association CREST Discovery Award. This is further explained on page 12.

The notes that follow provide guidance on how to run each of the activities from the starter activity through to the STEM challenge. The supporting PowerPoint (PPT) presentation and pupil sheets can be downloaded at [actionagainststuntingday/resources/schools](http://actionagainststuntingday/resources/schools)

# Starter activity

## – What is the problem? (20 mins)

Use PPT slides 1-2 to introduce the project to your pupils. It sets the scene for the starter activity.

*What is the problem?* is a whole class role play activity that enables pupils to find out more about the lives of some people living and working in countries affected by child stunting. It also provides an insight into the role of researchers in STEM projects around the world, a less well-known STEM career.

### Per class, you will need:

- A set of the image and role play cards (already cut out) from the *What is the problem?* pupil sheets

Introduce the role play activity with PPT slide 2. It introduces the scenario that soon, while in role, pupils will be joining an international project meeting. Some of them will be 'researchers' from the four countries involved in the project and others will be farmers, nurses, etc., all of whom have a stake in the project.

Split the class into four groups that represent the four countries taking part in the project. They are India, Indonesia, Senegal, and the UK. You may like to print out the flag from each of the countries and put that in the middle of their table or use the photographs provided.

Hand out the relevant *What is the problem?* role play cards to each country group. Either allow them to decide their roles or assign them yourself.

Instruct the two researchers from India, Indonesia, and Senegal to introduce themselves to the people in their country groups and ask them to take notes from the rest of the group. Encourage the rest of the group to share their stories amongst their country groups. The UK group are researchers based in different establishments. They can share their roles in any order. There is an extension option for the UK group to research into different roles such as 'clinical scientist'.

You might choose for this to be a listening activity or to extend it so that the researchers give a mini presentation to feed back their main points of learning to the rest of the class. Either way, use the questions on PPT slide 3 to help to reinforce key learning points from this activity.

### Do any of the people or countries have any issues in common? If so, what are they?

Issues in common include:

- health workers who share concerns about the impact of lack of malnutrition on children's development
- teachers who believe that poor nutrition affects a child's ability to concentrate and learn well
- farmers who end up wasting fresh fruits and vegetables as the cost of transporting goods to market is so high
- other than the UK, these countries experience high temperatures for most of the year. This causes problems for families who do not have a fridge, as fresh food perishes quickly in the heat
- parents who would like information to help their babies and children grow up healthily
- all countries have experienced researchers who are scientists, nutritionists, and STEM professionals.

### Why do you think some scientists and researchers choose to work across different countries? What might be the benefits of this?

Benefits of working across countries include:

- research can be combined so there is more data, making it easier to find out what is causing stunting
- the more scientists there are working together, the more chance there is of finding solutions
- solutions in one country may then be shared with another country.



# What is child stunting? (15 mins)

Now that the pupils have begun to get a sense of the issue they are exploring, use PPT slide 4 to explain what child stunting means.

We are appreciative of you raising awareness of child stunting with your pupils, and we recognise that it is a sensitive issue to talk about. It is likely to raise questions of why some children and families are suffering from what is largely a preventable problem that often relates to poverty, food security and inequality.

We want young people to see that change is possible and that organisations such as the United Nations (UN) are taking action to address global problems including child stunting.



## Extension or homework opportunities

Set pupils the task of researching some of the facts around child stunting.

The website here enables pupils to click on a world map to see the percentage of children who have stunted development.

[sdg-tracker.org/zero-hunger](https://sdg-tracker.org/zero-hunger)

# Sustainable Development Goals (15 mins)

The problem of child stunting is recognised by many organisations and governments. Use PPT slides 5-6 to introduce the seventeen Sustainable Development Goals (SDGs), also known as the Global Goals with their targets for 2025 and 2030.

The Action Against Stunting project aims to support many of the seventeen Global Goals. In particular, the goal Zero Hunger (Global Goal 2) that includes the target 2.2 *to reduce the number of stunted children under 5 by 40% by 2025*.



## Extension opportunity

To cover the UN's Sustainable Development Goals in more detail, there are many great resources and video clips. Here are some good starting points:

[globalgoals.org](https://globalgoals.org) – a wealth of information and resources

[worldslargestlesson.globalgoals.org/resource/introducing-the-global-goals](https://worldslargestlesson.globalgoals.org/resource/introducing-the-global-goals) – lessons on each goal

[sdgtoolkit.org/tool/sdgs-for-kids](https://sdgtoolkit.org/tool/sdgs-for-kids) – cartoons explaining each goal

[go-goals.org](https://go-goals.org) – SDGs board game

[youtu.be/sTt5YW7Pagc](https://youtu.be/sTt5YW7Pagc) – video by Emma Watson introducing the Global Goals and the role of STEM

[practicalaction.org/schools/sdgs](https://practicalaction.org/schools/sdgs) – teaching resources from International Development charity Practical Action

If you wish to make a display with the SDGs, the following link has a wealth of materials  
[un.org/sustainabledevelopment/news/communications-material](https://un.org/sustainabledevelopment/news/communications-material)



# Action Against Stunting

## - research is the key! (30 mins)

Despite the COVID pandemic affecting many of the countries where the project is running, progress has been made in some areas of research.

PPT slide 7 gives the pupils information on four key areas of research and prompts pupils to think about the methods that could be used to collect data for each one.

The following slides highlight examples of the information captured by AAS researchers using some of the research techniques.

PPT slide 8 introduces Malick Dia who was interviewed by one of AAS researchers working in the Kaffrine region of Senegal. The *Meet a farmer from Senegal* pupil sheet provides further information and highlights a problem experienced by many farmers: how to affordably transport their produce to market.

PPT slide 9 gives a snapshot of research findings from India into the lack of fruit and vegetables in people's diets.

Check the pupils' understanding of the key learning points from the *Meet a farmer from Senegal* pupil sheet and research by using the True or False statements on PPT slide 10.

### Science link

#### **i) Food decay** (10 mins)

This introduction helps to highlight the problem for farmers of how quickly some fruits and vegetables can deteriorate in the heat.

Ask the pupils what they think happens to fruit and vegetables when they are not eaten soon after being harvested. Do they know what causes food to go rotten or bad? If the pupils don't use the term 'decay' (or 'decompose') in their responses, introduce the word to describe what happens. With older pupils you may want to use this as an introduction to microbes.

These video clips provide a great opportunity to show time-lapse videos of a decomposing watermelon

[youtu.be/S12zZhdOckc](https://youtu.be/S12zZhdOckc)

and fruit and vegetables more generally

[youtu.be/c0En-BVbGc](https://youtu.be/c0En-BVbGc)

They will reinforce why it is so important for farmers to transport their produce as quickly as possible to market, and that some produce decays faster than others so are more difficult to store and transport.

#### **ii) Delay the decay – science investigation** (15 mins+)

If you have time, the following science investigation demonstrates how keeping fresh produce at a low temperature slows down food decay. Ideally, it should be started 4 weeks before pupils do the main STEM challenge. If that is not possible, it can be completed within 1-2 weeks by selecting fruits that decay quickly e.g. strawberries, blueberries, and raspberries.

*You will need:*

- a selection of fruit and vegetables
- plastic bags that seal at the top
- fridge or somewhere cold
- one *Delay the decay* sheet per pupil.

Ask pupils to think about what might help 'delay the decay' and how they would set up an investigation to test this. You would expect them to think of keeping produce in a cold place such as a fridge and comparing that to food just left in the open. Ask them to think about how else they might keep foods cold if they didn't have access to a fridge.

Divide pupils into small groups to work together on the investigation. The *Delay the decay* sheet can be used by pupils to record their investigation. For older/more able pupils you may like to use this as an opportunity for a more open-ended investigation.

Ask the pupils to place the fruits and vegetables in sealed plastic bags. Allow a minimum of two observations of the decaying fruits and vegetables per week.

**NB. For health and safety reasons do not allow them to open the sealed bags.**

Collate data from the different fruits and vegetables and discuss. You could use this to produce graphs showing the average time for decay of different produce kept in different conditions.

## A STEM challenge (3 hours)

Following pupils learning about the context for the AAS project and their own research, it is time to introduce their STEM challenge! Suggest that having been part of the project, they might have some ideas of how some of the causes of child stunting could be prevented.

*Invite them to consider, 'what if we could find a way to make it worthwhile for farmers to get their produce to local markets to families who are not eating the recommended daily amount of fresh fruit and vegetables?'*

Then, using PPT slide 11, introduce the challenge that they will work on in small teams. Their brief is to design and make an attachment or trailer for a bicycle to help farmers safely and affordably transport two different types of fruits and vegetables to local markets.

NB. In addition, and/or for a different STEM challenge, you might want pupils to consider how to package the fruits and vegetables and/or how to keep them protected from the heat or rain during transportation.

Ideally, source one or two bicycles that the pupils can use to attach their carrying device to. If possible, select at least one bicycle with a pannier frame on. For younger or SEN pupils, you can use a tricycle or bicycle with a fixed basket or container. Then differentiate the challenge to focus on packaging the fruits and vegetables to fit into the container.

To support the pupils throughout their challenge activities, show them PPT slide 12, listing the tasks and activities you expect them to complete.

**For pupils undertaking the CREST Discovery Award, PPT slide 13 highlights the pathway through the passport that they will need to complete.**

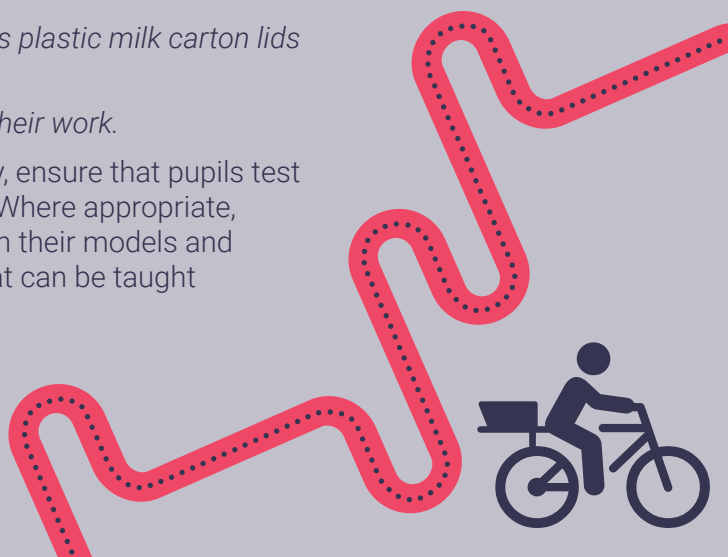
### For the challenge the pupils will need:

- a range of seasonal fruits and vegetables to test their models, including carrots, apples, bananas, pears, onions, etc.
- access to computers to support their research
- cutting and joining resources such as scissors, glue, masking tape, string, thin wire, elastic bands
- if possible, different types of organic material (the outer skins from corn or large leaves, for example) that can be used to protect and package produce
- making and modelling material such as card, reclaimed fabrics, junk modelling pots and food containers, cereal boxes, etc.
- small wheels and axles (or materials such as plastic milk carton lids and doweling)
- access to computers to help them present their work.

Throughout the designing and making activity, ensure that pupils test their ideas and adapt them as they go along. Where appropriate, demonstrate ways to reinforce and strengthen their models and prototypes and other technical knowledge that can be taught through the project.

The video clip, Wheel and Axle shows how to make simple moving models.

[youtube.com/watch?v=ndT35aqDfAQ](https://youtube.com/watch?v=ndT35aqDfAQ)





# Testing models and/or prototypes (1 hour)

When it comes to testing their models, it would make the challenge more realistic (and fun!) to set up a 'road to market' in the playground.

Pupils can then test out how much produce they can transport in one journey or over a set time of 2-3 minutes per group.

*NB. We suggest that you risk assess this activity. The pupils do not have to cycle the bikes to test their models, they can push their bikes to market!*

## Presentation

Before pupils get started on their challenge, explain to them that as well as testing they will be presenting their work to the rest of the class.

Allow time for them to get their presentation together. Encourage them to share what worked well and what didn't as well as their final design. You could ask some of the other pupils to feedback on one thing they liked about another team's design and/or how they worked together.



## Extension activities

For older or more able pupils or those looking to achieve a CREST Award at Bronze level, you might ask them to consider the following:

### Climate

India, Indonesia and Senegal are all countries that experience high temperatures and heavy rains at certain times of the year. What could they do to protect their produce from the heat and/or rain?

If time allows, pupils could test how good their containers are at insulating produce by filling the container with cold water and recording the temperature increase over a period of days. This is a great opportunity to use dataloggers and could also lead to some interesting work on the collection and presentation of data.

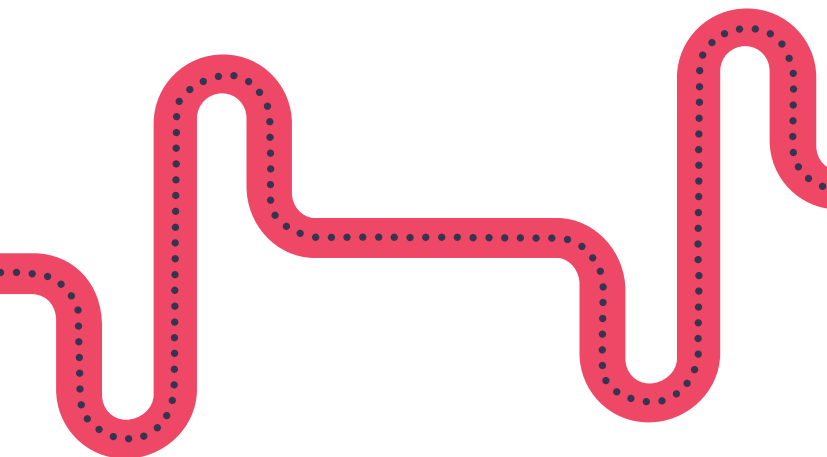
Pupils could also try different designs and compare them. For research, they could look at how food was kept cold before we had electricity, and how people around the world who do not have electricity keep produce cool (e.g. in zeer pots).

This extension could also lead to research into the role of microorganisms.

### Fruits and vegetables campaign

Sometimes children can be fussy about eating fruit and vegetables.

Ask pupils to develop an idea to educate children about the importance of eating them daily. Encourage them to think about how children like to learn and be creative! It could be a game, poster, song. This could form part of the presentation back to the class.



# Curriculum links

The activities within this resource support the coverage of the following areas of the National Curriculum for England (and their equivalent in other nations) in the subjects of Science and Design and Technology.

## Science

### KS2 Science – Pupils should be taught:

- Uses of everyday materials – identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, and cardboard for different uses
- Animals including humans – recognise the impact of diet, exercise, drugs, and lifestyle on the way their bodies function.

### KS3 Biology – Pupils should be taught:

- Nutrition and digestion – the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases
- Cellular respiration – the process of anaerobic respiration in humans and micro-organisms.

### KS3 Physics – Pupils should be taught:

- Energy changes and transfer – heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) or radiation; such transfers tending to reduce the temperature difference: use of insulators.

## Design and technology

### KS2 Design – Pupils should be taught to:

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.

### KS2 Make – Pupils should be taught to:

- select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining, and finishing), accurately
- select from and use a wider range of materials and components, including construction materials, textiles, and ingredients, according to their functional properties and aesthetic qualities.

### KS2 Technical knowledge – Pupils should be taught to:

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures.

### KS3 Design - Pupils should be taught to:

- use research and exploration, such as the study of different cultures, to identify and understand user needs
- develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations.

### KS3 Technical knowledge – Pupils should be taught to:

- understand and use the properties of materials and the performance of structural elements to achieve functioning solutions.

# Cross curricular ideas

The Road to Zero Hunger provides several opportunities for extended learning into a range of other curriculum areas.

## Cross curricular opportunities in...

### English

- **Develop an eat more fruits and vegetables campaign** – children can be fussy about eating fruits and vegetables. Encourage your pupils to develop an idea to help children understand the importance of eating more fruits and vegetables. It could be a game, a poster or a song. Be creative!

### Geography

- **Explore more!** – India, Indonesia and Senegal provide a wealth of opportunities for pupils to learn more about the people and physical geography of these countries.

### Science

- **Keeping cool!** – a big problem for farmers and families is how to store foods that ‘go-off’ or de-grade quickly in hot countries where people might not have access to refrigeration. Encourage your pupils to research into methods of keeping fruits and vegetables cool
- **Cool pots** – in addition, a practical science-based activity to make ‘Cool pots’ can be found here [practicalaction.org/schools/cool-pots](http://practicalaction.org/schools/cool-pots)

### Maths

- **Nets** – enable your pupils to explore nets that can make good shapes for packaging and containers
- **Measure the height of baby dolls** – set up the opportunity for pupils to measure the height of baby dolls
- **Weighing and measuring fruits and vegetables** – set up an activity for pupils to see how much a day’s recommended intake looks like in terms of different fruits and vegetables
- **Using money** – hold a ‘role play’ of a market where pupils buy 400g of fruits and vegetables
- **5 a day** – set up a shop or market stall where pupils can calculate the costs of five portions of fruits and vegetables. Challenge them to see who can find the cheapest?

### Cooking and nutrition

- **Make fruit leathers** – set up a food practical to enable pupils to make fruit leathers out of fruits that are in season. This is a good way of using up and preserving fruits that can be kept for later eating!

### Art

- **Fruits and vegetables art** – enable pupils to either draw, paint, or collage the fruits and vegetables they have observed. Parts can be labelled for a creative ‘STEAM’ activity.

# National initiatives and competitions

The Road to Zero Hunger is a perfect project for several UK based awards and competitions.



## CREST Awards

This resource has been accredited by the British Science Association for a CREST Discovery Award. It can also be used to gain a Superstar Award (primary) and as a context for Bronze, Silver and Gold Awards (Secondary).

[crest.org](http://crest.org)



## Big Bang Fair competition

Pupils aged 11-18 who have taken part in a STEM challenge can enter their work into the Big Bang competition. This is a great way for pupils to showcase their work to other pupils and adults at a regional Big Bang event.

[competition.thebigbangfair.co.uk](http://competition.thebigbangfair.co.uk)



## British Science Week

An initiative for all ages from the British Science Association which takes place in March each year. To find out what grants are available go to

[britishscienceweek.org/guide-to-funding-for-british-science-week](http://britishscienceweek.org/guide-to-funding-for-british-science-week)

[britishscienceweek.org](http://britishscienceweek.org)



## The Great Science Share for schools

This encourages all pupils to share their science projects with other pupils and schools.

There are lots of support materials on their main website

[greatscienceshare.org](http://greatscienceshare.org)

## What next?

If you have enjoyed working on this project, then please keep updated with Action Against Stunting. We will be producing more education resources over the next few years. So please keep an eye out for them here,

[actionagainststuntingday.org](http://actionagainststuntingday.org)

Please feel free to share your stories of working on these resources on social media channels #StandUpToStunting

 [actionstunting](https://www.facebook.com/actionstunting)

 [actionstunting](https://twitter.com/actionstunting)