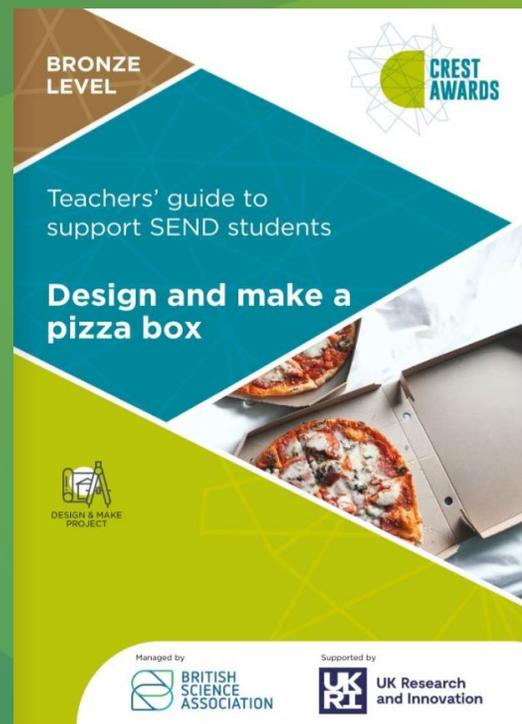




# Adapting STEM resources for use with SEND students

*Highlights from a session given at the ASE Conference 2024, in partnership with Rob Butler*





# What are the guiding principles for adapting resources for learners with SEND?

The guiding principles outlined here will support all learners, not just those with SEND.

These supermarket doors meet the requirements of disability laws and welcome shoppers with a physical disability into the store.

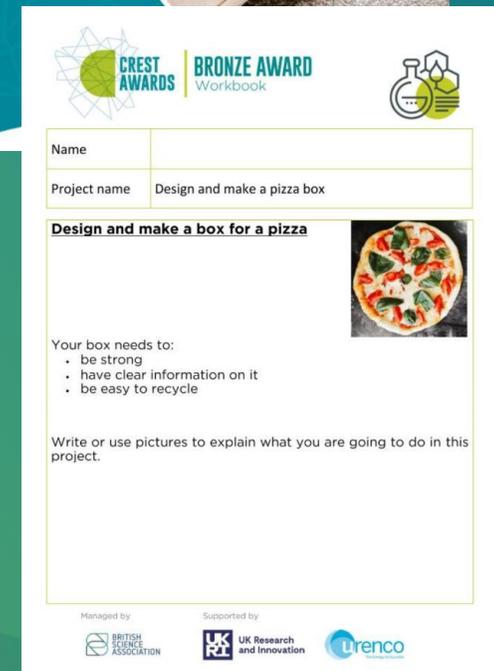
The sliding doors also benefit all shoppers, including a busy teacher carrying marking, or a parent/carer with a pushchair.

In the same way, the adaptations that follow can benefit and support all learners.



# Guiding principle 1: remove references to age

- We know that learners may not be working at the cognitive level that their age would suggest. If ages are included on resources and they are then used with older learners, whilst the work may be at an appropriate level it can damage self-esteem.
- Take care to use imagery that can work with any age group (children doing less demanding activities don't want childish contexts).



The image shows a page from the workbook. At the top, it says 'CREST AWARDS BRONZE AWARD Workbook' and includes a small icon of a pizza box. Below this is a form with the following fields:

|              |                             |
|--------------|-----------------------------|
| Name         |                             |
| Project name | Design and make a pizza box |

**Design and make a box for a pizza**



Your box needs to:

- be strong
- have clear information on it
- be easy to recycle

Write or use pictures to explain what you are going to do in this project.

At the bottom, it says 'Managed by' and 'Supported by' with logos for the British Science Association, UK Research and Innovation, and Lurengo.

# Guiding principle 2: think about the cultural and science capital of your learners

- You can't assume that your learners have a common set of experiences. For example, whilst we might expect most learners to know what a pizza is, many may not have seen or experienced a takeaway pizza box.
- Provide stimulus material – videos, adverts or real examples allow learners to fill in the gaps where there might be unfamiliarity.



## Pizza packaging

In the video, we saw that pizzas were packaged in three ways.

What were they?



# Guiding principle 3: avoid superfluous information and graphics...

- These add to the cognitive load.
- Sometimes learners remember the wrong things!



Vocabulary Sheet

|          |   |             |   |
|----------|---|-------------|---|
| shop     |  | strong      |    |
| idea     |  | weigh       |    |
| scissors |  | shape       |   |
| cut      |  | measure     |  |
| glue     |  | cardboard   |  |
|          |   | information |  |
|          |   | recycle     |  |
|          |   | landfill    |  |
|          |   | award       |  |
|          |   | ingredients |  |

...but some visuals are useful.

- We know many learners find images useful - they can help add meaning to unfamiliar text.
- Symbols can be useful for learners who have weaker literacy skills or EAL.

# Guiding principle 4: consider the language and readability of the text

Widgit Vocabulary Sheet

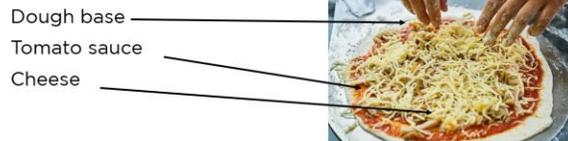
|  |  |
|--|--|
| pizza     | strong        |
| box       | weigh         |
| project   | shape         |
| design    | measure       |
| make      | cardboard     |
| shop      | information   |
| idea      | recycle       |
| scissors  | landfill      |
|  | award         |
|  | ingredients  |

We know that many learners struggle with literacy. You can support by:

- Providing definitions of words that might be unfamiliar (rewordify.com can help identify these).
- Use short sentences.
- Try to keep the vocabulary simple (but don't simplify the terminology/key words).
- Break tasks down – chunking.

## Parts of a pizza

What are the main parts of a pizza?



# Guiding principle 5: think about font and format

- Consider the font – make sure it is large enough to read, that it has good contrast with the background and is sans-serif (no flicks).
- Don't use a handwriting font.
- Use bold for emphasis rather than underlining, italics or caps (this makes the text easier to read).
- By providing the resources in an editable format, educators can then change the font (e.g. to a dyslexia friendly typeface) or the colours to suit the needs of their learners.
- The flow of text on a document can be important for learners who use screen reading software (this isn't just visually impaired learners). Avoid columns which can confuse the software.

## Pizza toppings

Pizzas can have different toppings, such as:

mushrooms

tomatoes

Have you tried any different types of pizzas?



crestawards.org

## What happens to the pizza box?

Do you throw it in a waste bin or recycling bin?



crestawards.org

# Guiding principle 6: be flexible when gathering evidence

- Many learners struggle to structure, sequence and plan their writing. A template or scaffold can help here.
- Learners could use different forms of recording evidence, e.g. creating a review or audio notes, rather than writing a formal report.
- Can you provide question stems/starters to get learners talking/writing about their science work?

| Results – which box is the strongest?   |         |
|---|---------|
| Write or draw your results.             |         |
| Box                                     | Results |
| 1.                                      |         |
| 2.                                      |         |
| 3.                                      |         |
| 4.                                      |         |
| Which box is the strongest?             |         |
| What do you think makes the box strong? |         |

| What information needs to go on my pizza box?                                       |  |
|---|--|
|   |  |
|  |  |
|   |  |
|   |  |

| Design ideas for my pizza box   |  |
|---|--|
| Draw your ideas for your pizza box.   |  |
|  |  |
|   |  |

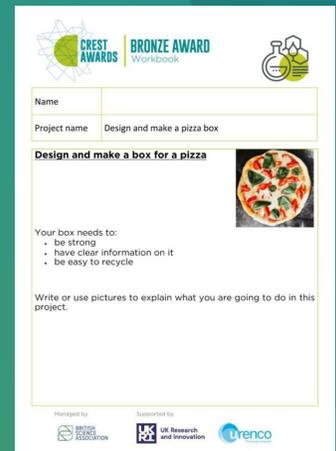
  

| Make your pizza box   |  |
|---|--|
| Work safely to make your box for your pizza.  |  |
|  |  |
| Take a photograph of your box and stick it here.                                    |  |
|   |  |
| <b>How well did your project go?</b>  |  |
| Have you made a box that:   |  |
| - Is strong to protect the pizza? <b>Yes</b> or <b>No</b> .                         |  |
| - Has information on about the pizza? <b>Yes</b> or <b>No</b> .                     |  |
| What could you have done to make your pizza box better?                             |  |
|   |  |

# Recap on the guiding principles for adapting resources for learners with SEND

1. Remove reference to age
2. Think about the cultural and science capital of the learners
3. Avoid unnecessary information and graphics...but some visuals are useful (images that add meaning to the text)
4. Consider the language and readability of the text
5. Think about font and format (not too small, good contrast, no handwriting fonts or serifs, bold for emphasis)
6. Be flexible when gathering evidence (writing frames/prompts, non-written records)

***Activity: can you find examples of the guiding principles in the CREST Bronze 'Design and make a pizza box' resources?***

A worksheet for the "Design and make a pizza box" project. It includes the CREST Awards logo, the title "BRONZE AWARD Workbook", and a small image of a pizza. The form has fields for "Name" and "Project name" (pre-filled with "Design and make a pizza box"). Below is a section titled "Design and make a box for a pizza" with a list of requirements: "Your box needs to: be strong, have clear information on it, be easy to recycle". There is a space for students to "Write or use pictures to explain what you are going to do in this project." Logos for the British Science Association, UK Research and Innovation, and Urenco are at the bottom.



## *Activity - how could you apply the guiding principles?*

- Think about a STEM resource you have used recently or one you are planning to use with SEND learners. How could you apply one of the guiding principles to ensure that it is accessible?
- Write down at least one idea that you could action! How will this impact your SEND students?

