TRINITY HOUSE

KEY STAGE 3 // AGES 11–14 // 50–60 MINUTES

Safety at sea
KS3 Teacher notes

TRINITY HOUSE

Safety at sea

Age range:

KS3/11–14 year-olds

Key words:

Safety, navigation, mariner, seafarer, transportation, materials, resources, buoy, maritime, design brief, iterative, evaluate, specification

Lesson objectives:

By the end of the lesson students will be able to:

- Understand how Trinity House keeps ships and seafarers safe by providing a mix of aids to navigation;
- Identify and solve their own design problems and understand how to address problems given to them;
- Review designs, provide constructive feedback and work within a team.

Resources:

- Slides: Safety at sea;
- Worksheet 1: Design a buoy.

Starter: What am I?

10–15 minutes

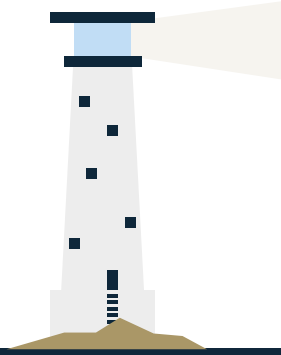
Run through slide 4 which contains a range of statements designed to slowly reveal the identity of an unknown object. Students should try to guess what is being described, before revealing that the item is a buoy.

Slide 6 explains what a buoy is and its importance as an aid to navigation. Explain that a buoy's visual appearance — its shape and colour — is understood by seafarers around the world. Seafarers recognise their purpose in warning them about marine hazards to avoid and marking out safe channels for passage. Slide 7 describes the role of Trinity House in keeping ships and crew safe as they travel in UK waters.

Play the 'Our aids to navigation' video on slide 8 and run through the quick fire quiz questions and answers on slides 9–12.

Curriculum link: Design and Technology

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



Activity 1: Exploring buoys

30–40 minutes*

Using slides 14–17, explain how different buoys can be distinguished from each other by seafarers.

Slides 18–22 explain the history and visual characteristics of the Emergency Wreck Marking Buoy – currently used in UK waters to identify and warn seafarers about wrecks and other dangers to navigation. Run through these slides to set the context for the following design challenge on slide 23.

Hand students a copy of Worksheet 1. Students should work independently through the design brief and specification stages. Students may use workbooks or the internet to inform their research. They should then complete two annotated sketches in pairs before swapping their sketches with another pair and critiquing each other's designs.

The next step is for students to develop their best idea. This should be the design that their partner agreed best aligned with the specifications.

Once they have developed their best idea into a final drawing, they should swap with the same partner to review each other's completed designs.

Depending on the time allocated to this activity, and the materials available, students can progress their sketches further by creating a 3D model of their design. Groups not progressing to the modelling stage can move straight to the evaluation.

Curriculum link: Design and Technology

Design:

- Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations;
- Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools.

Evaluate:

- Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups.

**You may wish to split this activity into two lessons depending on the time you have available.*

Helpful definitions

Topmark:

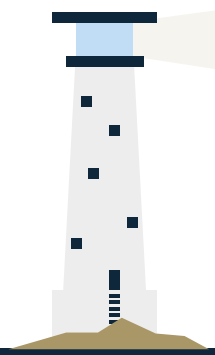
- Buoys need to be recognised both in daylight and at night and use topmarks to assist in identification;
- For instance, a topmark on a Cardinal Buoy is triangular and coloured black;
- Topmarks and buoy colours are arranged in order to represent the points of the compass.

Port:

- Lateral marks indicate the port and starboard hand sides to be followed by a vessel entering port;
- Port marks should be kept to the vessel's left side.

Starboard:

- Starboard marks should be kept to the vessel's right side.



Worksheet 1: Design a buoy

Design brief: I am going to design a...

The name of the buoy will be:

The dangers that your buoy will warn seafarers about are:

Key word: *Design brief:* a short statement to explain what problem is going to be solved by the designer

Investigation statement: The main reason seafarers need this aid to navigation...

Specification: What three things do you think your design needs to be successful? You may need to complete some research to help you with this section.

1.

2.

3.

Tip: think about the environmental considerations. How will weather and seawater affect the materials you use and your design?

Design ideas:

Now that you have completed your research, create some sketches to visualise your ideas.

Try to come up with two different sketches.

Tip: Use annotation (notes) to show in words what you cannot draw.

Now that you have completed your designs, it is time to think critically.

Working with a partner, talk through your two design sketches, explaining how each idea meets the points in the specification. Swap worksheets with your partner and write your feedback for their designs.

Design partner name:

Design partner comments:

I like:

I would change:

My preferred design is:

Now that you have feedback on your designs, choose the best one to develop.

Use the space below to draw it and remember to include annotations and colour to your drawing.

Design partner comments:

I like the finished design because:

Evaluation

Now you have developed your idea, how effectively do you think it meets the design specification?

Based on your evaluation and your partner's comments, what would you do differently next time?