SAFETY AND RESCUE IN BANNAU BRYCHEINIOG

SUPPORT MATERIALS

If you need further support on specific aspects of outdoor learning these materials can enhance the engaging experiences you are providing. They can support you as you design, plan and implement your curriculum. Outdoor learning is a great way to develop learners' integral skills (creativity and innovation, critical thinking and problem-solving, personal effectiveness, planning and organising). You will want to focus on why learning matters and ensure you are meeting your learners' needs.
These materials show a path that could be taken through the activity. This is not meant to be prescriptive. You should adapt your approach depending on your learners' needs and interests and your local area.

OVERVIEW

Learners find out about mountain rescue in Bannau Brycheiniog National Park leading to writing a Tweet/X about a recent rescue by one of the teams - as a news reporter. They explore the advice given to hill walkers and make a car sticker to advise people to wear suitable clothing when hill walking in Bannau Brycheiniog. Learners learn about pulleys as a means of moving heavy objects with minimum effort force. They make their own pulley and test it. Finally, learners design, make and test a zip wire outside for a doll-type toy.

CURRICULUM FOR WALES

Areas explored:

- Expressive Arts
- Health and Well-being
- Languages, Literacy and Communication
- Mathematics and Numeracy
- Science and Technology

Activity also incorporates aspects of cross-curricular skills outlined in the LNF and DCF.

RESOURCES

Internet enabled device and internet access.
Means of building a pulley: per group - two cereal boxes, cotton reel, pencils, paperclips, ten to fifteen 10p pieces or large metal washers, sticky tape, string, scissors, ruler.
Means of building a toy zip wire: per group - a clothes lines, a small pulley, zip ties or string or rubber bands, a stopwatch or timer and a sports measuring tape.

DOING THE ACTIVITY

- Most tasks require learners to work in pairs or groups.
- Encourage learners to share their ideas, and through open questioning, explain and justify their ideas when possible. Focus questions have been suggested to guide learners through the tasks.
- Some tasks might be more effective if pairs or groups of learners have access to an internet enabled device.
- To access the scale in Google maps, click on 'View larger map'.
- When taking learners outdoors, it is essential that the Countryside Code is adhered to and any relevant risk assessments have been carried out with risks mitigated.

TASK 1

WHAT DO WE KNOW ABOUT MOUNTAIN RESCUE?

Explain to learners that in this task they will consider mountain rescue in Bannau Brycheiniog National Park.

Screen 3

This screen gives a description of mountain rescue from the Mountain Rescue England and Wales website. Ask learners to read the text and discuss the questions posed.

Focus questions

- When have you seen a mountain rescue team? Where was it?
- Where do you think the mountain rescue teams are based in Bannau Brycheiniog?
- What do you know about mountain rescue? How do you know this?

Screen 4

Show learners the map of the mountain rescue team bases in Wales and ask them to discuss the questions posed.

Focus questions

- Which mountain rescue bases did you know about?
- Which is the nearest mountain rescue base to school? How did you estimate this?

Screen 5

This screen describes the organisation of the south Wales mountain rescue teams and the area they cover.

Screen 6

Ask learners to choose one of the mountain rescue teams; Brecon, Central Beacons, Longtown or Western Beacons. Then, search on the internet to find out...

- When was the last rescue made by this team? Why was the team needed?
- Which other teams did they work with? Why?
- What were the outcomes of the rescue?

Remind them to:

Before researching think about...

- What search terms could you use? Which are the best? Why?
- What type of sites will be the best to use, why?

When assessing information/data think about...

- Could the information/data be biased? Why do you think that?
- How reliable do you think the information/data is? How could you find out?

Screen 7

Invite learners to write a Tweet/X about their research findings - as a news reporter. Remind them that they only have 280 characters.

TASK 2

WHY IS HILL SAFETY IMPORTANT?

Explain to learners that in this task they will explore the advice given to hill walkers and eventually make a car sticker to advise people to wear suitable clothing when hill walking in Bannau Brycheiniog.

Screen 3

Explain to learners that the Mountain Rescue England and Wales gives guidance on hill safety, which includes:

Before you set out: charge your phone, plan your route carefully, check the weather and leave details of your route plan (with someone else). Ask learners to discuss the questions posed.

Focus questions

- Why do you think each of these steps is important?
- What might happen if you missed one of these steps?

Screen 4

Here is more of the guidance:

On the hill: keep an eye on the weather, keep the party together, eat well through the day and watch for signs of hypothermia. Ask learners to discuss the questions posed.

Focus questions

- Why do you think each of these steps is important?
- What might happen if you missed one of these steps?
- Advice is also given for people who walk on their own. What do you think this advice might be? Why?
- What do you think are the extra risks for people who walk on their own? Why?
- In the case of an emergency on the hill, what do you think you should do? Why?

You could also add to this guidance, e.g.

- Be prepared to turn back if conditions turn against you, even if this upsets a long-planned adventure.
- Allow the slowest in the party to determine the pace and take special care of the youngest, weakest and least knowledgeable in dangerous places.
- Before you start and through the day, keep your energy levels high to get the most out of your day.
- Hypothermia symptoms include: disorientation, confusion, shivering, tiredness, pale complexion and loss of circulation in hands or toes. Children and older people are especially susceptible.

Advice for those who go out alone... be aware of the extra risk. Let people know your route and when you expect to finish and then stick to it as far as you can. If your plans change, let them know that too.

Screen 5

Invite learners to imagine they have been on a long hill walk and one of their group has fallen and badly hurt themselves. Then, to discuss the question posed.

Focus question

- What do you think you should do?

Ask learners to list the order they would do these things in the box provided.

Screen 6

Ask learners to check their list against the advice given by the Mountain Rescue association, given on this screen.

Screen 7

Invite learners to try the quiz about which of the things listed they think they should take with them for a long hill walk.

Screen 8

Ask learners to access and read the article A woman was pictured walking up Pen y Fan in the snow - wearing heeled boots – Wales Online. Then, to discuss the questions posed.

Focus questions

- Where is Pen y Fan? How do you know?
- Why do you think the article was written?
- What types of unsuitable clothing are mentioned? Why is each one unsuitable?
- For each type of unsuitable clothing, what should the person have been wearing?

Screen 9

Tell learners they are going to design a sticker to put on a car to advise people to wear suitable clothing when hill walking in Bannau Brycheiniog. Some examples of car stickers are shown. Ask them to discuss the questions posed.

Focus questions

- What message does each sticker convey?
- Why is each sticker a particular shape?
- What symbols/images does each sticker use?
- How effective is each sticker? Why?

Screen 10

Invite learners to discuss the questions posed.

Focus questions

- What key words could you use in your sticker?
- What symbols or images could you use in your sticker?
- How will the images and symbols convey your message?

Ask learners to jot down some ideas for their sticker and draw some draft ideas.

Screen 11

Explain to learners that the size of their sticker can be up to 15cm long and 15cm wide.

Looking at their ideas about words and symbols/images, ask them to discuss the questions posed.

Focus questions

- Which words, symbols and images will best convey your message? Why?
- What shape should your sticker be? Why?

Invite learners to draft their design in the shape they have decided on and to make sure it fits within the correct dimensions.

Then, to make their sticker.

Screen 12

The final screen in this task offers learners a chance to use one or more of the sentence starters provided to reflect on the task - I understood better when...; One thing we did today that made me realise...; The thing that really helped me today was...; To improve I could...; After reading, I...; I could use this strategy when...; The next time I could...; After talking to...; The thing I found most difficult was...; One idea/thing I still don't understand is....

TASK 3

WHAT IS A PULLEY?

Explain to learners that they are going to learn about pulleys as a means of moving heavy objects with minimum effort force. They will make their own pulley and test it.

Screen 3

Explain to learners that mountain rescue teams use ropes and pulleys to help them reach injured people and lift them to safety. A photograph is on screen to show this.

Screen 4

Ask learners to discuss the questions posed.

Focus questions

- Where have you seen people using ropes before? What were the ropes being used for?
- Where have you seen pulleys being used? What were they being used for? How do you know?

Screen 5

Explain to pairs of learners that pulleys are simple machines that make lifting objects easier.

They are made from a wheel and axle, with a rope wrapped around the wheel.

Screen 6

Here a photograph of a crane describes that this is a common example of a pulley system. These are used in the construction industry to lift heavy equipment and materials. For example, lifting bricks and concrete to the upper floors when building a skyscraper.

Screen 7

Invite learners to design a pulley that can lift washers. Then, to try out the pulley to see if it works. If not, ask them to redesign it so it does work. A list of equipment is given.

Once they have designed their pulley, ask them to compare their pulley with others in the class.

If learners get stuck, here are some instructions:

- Stand two cereal boxes up parallel to each other on a table or desk.
- Poke two holes across from each other towards the top of the cereal boxes (on their inner faces), so you can push a pencil through the holes and it will be supported by the boxes.
- Tie a string to one of the pencils and thread it through the holes in the cereal boxes.
- Attach a paper clip or metal washer to the other end of the string.
- Pull down on the string to lift the load (the paper clip or washer).

Observe how the pulley changes the direction of force and makes lifting easier.

Remember that real-world pulleys have some friction, so you'll need to exert a little extra force to overcome it.

Screen 8

Ask learners to discuss the questions posed.

Focus questions

- How could you improve your pulley? Why would your ideas work?
- What are the forces acting when your pulley is working? In what direction are these forces acting?

Then, ask them to draw a diagram to show the forces acting when their pulley is working.

Screen 9

Explain to learners how a single fixed pulley works as shown in the animation:

The load is the weight of the object being lifted.

The effort is the pulling force that is needed to lift the load.

Both the effort and load are forces and are measured in newtons (N).

In this pulley, the effort force and the load force are equal.

Ask learners to discuss the questions posed.

Focus questions

- What advantage does this pulley give you when trying to lift a heavy object?
- Where would you find this type of pulley?

Screen 10

This screen gives an animation to show how a single moveable pulley works. Explain that this pulley gives an ideal mechanical advantage of 2. Then, ask them to discuss the questions posed.

Focus questions

- What do you think an 'ideal mechanical advantage of 2' means? Be prepared to explain your reasoning.
- Where would you find this type of pulley?
- What type of pulley did you make? Why do you think this?

TASK 4

DESIGNING A ZIP WIRE

Explain to learners that they are going to design, make and test a zip wire outside for a doll-type toy.

Screen 3

Explain to learners that single fixed pulleys are used in zip wires. Ask them to discuss the questions posed.

Focus questions

- What does a zip wire look like? How do you know?
- Have you been on a zip wire? When? What was the experience like?
- What features make a good zip wire?
- Which is the best zip wire in the world? How can you find out?
- How can you explain to the class why this is the best zip wire?
- Where do you think the pulley would be in a zip wire?

Screen 4

Inform learners they are going to design, build and test their own zip wire for a doll-type toy outside. Invite them, in small groups, to think about the criteria that make a zip wire successful. Then, to list as many criteria as they can. Ask learners to prioritise their success criteria and type their top five criteria in the box.

Screen 5

Tell learners that each group will have: a clothes lines, a small pulley, zip ties or string or rubber bands, a stopwatch or timer and a sports measuring tape.

Invite them to design their zip wire, remembering their success criteria.

Ask them to draw their design and label it with the features that help it meet their success criteria and any measurements.

If they get stuck:

How to make a zip wire:

1. Anchor each end of the clothes line to bushes/trees.
2. Attach the pulley and tie on the toy.
3. Once the toy gets to the bottom you can take it off.

Note: *most learners will want to measure the time taken for the doll to travel from the top to the bottom of the zip wire. Some might also be interested in thinking about speed. To calculate the speed they will need to measure the distance travelled by the doll and the time it takes for the doll to travel down the zip wire. Then, to do the calculation: distance/time – to get an answer in m or cm per second.*

Screen 6

Ask learners to discuss the questions posed.

Focus questions

- When testing your zip wire, what will you measure? How will you measure it?
- How will you make your tests of the zip wire fair?
- How will you make sure that the measurements you make are reliable – that is not just a fluke?

Screen 7

Inform learners that outside, they will:

- experiment with setting up their zip wire
- try several test runs
- adjust their design to improve it.

Explain to them that they could test their zip wire with a higher or lower slope. Ask them to consider - How can you measure the slope? What other equipment would you need?

Screen 8

Take learners outside to build and test their zip wire.

Screen 9

Invite each group of learners to draw the finished design of their zip wire, remembering their success criteria.

Ask them to label their design with the features that help it meet each of their success criteria and discuss the questions posed.

Focus questions

- How well does your design meet each success criterion?
- Are there any other success criteria you would like to add to your original list? If so, what are they?

Screen 10

Ask learners to think about the test they did on their zip wire, and discuss the questions posed.

Focus questions

- How did you make sure your tests were fair?
- How did you make sure your results were reliable?
- How does your zip wire work?
- What forces are being used in your zip wire? How do you know?
- How could you improve your zip wire? Why would your ideas work?

Screen 11

Invite learners to start at the base of the triangle and think about the ways they worked to make their zip wire: individually, groups, online, paired work. Then, to consider the strategies they used from: reading, researching, drawing, reviewing prior work, classifying, discussing, making prototypes, using models, using examples, making lists. They can also suggest other strategies used. Finally, ask learners to consider which strategies worked the best. This latter information will be useful for similar future activities.