Guess My Shadow

Notes for teachers/ adults supervising the task.

Objective: To understand that shadows are made when light from a source is blocked by an object and that the shape of the shadow is the same as the shape of the object.

You will need:
A bright lamp, a light coloured wall, screen or large sheet of white card, a mini whiteboard and dry wipe pen per child, a selection of familiar household and classroom items in a box.

1. Set up the equipment as shown in the diagram with children seated facing a screen. Each child needs their own mini whiteboard and pen to record their guesses
2. Choose a child in turn to select an item from the box and hold it into the beam of light behind the heads of the rest of the group.
3. Without peeping the group should try to guess each item from the shadow and write down their response on their whiteboard.
4. Once everyone has guessed the child holding the item should reveal its identity by bringing it round to the front of the group (discourage children from turning round as it is bad for their eyes to look into the light source)
5. Children can mark their guesses with a tick or cross
6. Children could experiment with showing an unusual angle of the object first before they gradually turn it to reveal its identity. This will help the children to understand that the shape of the shadow of an item can be very different depending on which aspect of it is facing the light source, e.g. a pencil can be seen as a dot if it is orientated with the end facing the light source.
Task 2

Describe that Shadow

Notes for teachers/ adults supervising the task.

Objective: To recognise that shadows are formed when light from a light source is blocked by an opaque object and that the shadow will be different if the object is transparent or translucent.

You will need:
An overhead projector, a screen or light coloured wall and a collection of opaque, transparent and translucent objects including a pair of glasses with clear glass lenses and opaque frames.

1. Switch on the overhead projector so that it is projecting onto a screen or wall.

2. Place a pair of glasses on the screen. Look at the shadow? What is it like? Hopefully some of children will notice that the frame casts a solid dark shadow whilst the glass lenses cast hardly any shadow or none at all. Ask the children why this is and discuss their ideas. Explain that the frames are made of a type of plastic that blocks the light. We call materials that block light opaque. The frames of the glasses are opaque because no light passes through. But what about the lenses? Yes there is no shadow so the lenses are not blocking the light. Materials that allow light to shine straight through like glass are called transparent. If you look through a transparent object you can see right through it. Leave the glasses on the projector.

3. Ask a child to choose another object from the selection to put on top. Look at the shadow it casts on the screen. Discuss the shadow. Is it made of opaque material, or transparent, or both like the glasses? If a shadow is cast that is not as dark as the frames of the glasses, ask the children why this might be. Explain that there is a third type of material that we call translucent. Translucent materials allow some light to pass through them but they scatter the light in all directions. This means that you cannot see clearly through them. In other words, they blur the detail of what you can see when you try to look through them. Pass round a translucent object for the children to look through, e.g. a
sandwich tub or clean milk carton of the type shown above. Encourage them to put their hand directly behind it. Can they see the vague shape of their hand? Discuss how the shadow of a translucent object is different from the shadow of a transparent object. It may be dark but not as dark as an opaque object.

4. Ask each child in turn to select an object and get the group to predict what the shadow will look like by making decisions as to whether it is made from transparent, translucent or opaque material. Test it out on the projector. It will be useful to keep the glasses on the screen as a reference point.

5. Discuss the fact that coloured plastics and glass can be transparent (if you can see clearly through them), or translucent (if you can’t). What do they notice about the shadows of coloured transparent objects? Yes - they cast a coloured shadow! This may be useful to remember when we create our shadow puppet shows.
Task 2

I understand that shadows are made when light from a source is blocked by an object and that the shape of the shadow is the same as the shape of the object.

Hand Shadow Puppets

Working with a partner, it is fun to make shadows using your hand and a torch. Take turns to shine a bright torch at a wall or a propped up sheet of white card while the other one makes shadows with their hands. Notice how the shape of the shadow changes as you move your hand into different shapes. Remember the shadow is made when your hand blocks the light. Try one or two of the hand shadow puppet ideas below and then swap round with your partner.
Teachers’ Notes

Blackout Facilities

During this session the children will be investigating shadows which will be much easier to see in a darkened room. If your classroom has blackout blinds use these to block out extraneous light for the investigation tasks. If you do not have this option, consider arranging to do the investigative tasks in a different room that has blackout facilities, e.g. the hall.

Light Sources

Ensure that you have good quality torches for the children to use for investigations. Choose torches with a focused forward facing beam if possible rather than those with a lantern style head that throws light all around. Make sure the batteries have plenty of life in them. Weak torches and flat batteries will not allow children to investigate shadows in a rewarding and meaningful way. Overhead projectors and ceiling mounted projectors are powerful light sources that are ideal for shadow investigations. When using them, be sure to warn the children of the dangers of looking directly into the light. Also remind them of the importance of not shining torches into people’s eyes.

Screens

During the investigative part of the lesson you will need a number of screens on which to project shadows. Ideally you will need two screens large enough for a group of children to see. One could be your projector screen and the other a section of plain, pale coloured wall. If you do not have a suitable wall you could hang a white sheet or tape an A1 sheet of white card to a cupboard or shelf. For task 3, pairs of children will need a small screen to create hand shadow puppets. An A3 sheet of white card propped up on the table or taped to a piece of classroom equipment will work well.

YouTube film clips

There are two useful YouTube film clips recommended for this session. Consider downloading them ahead of the session to avoid unsuitable or distracting advertisements popping up during the lesson.

Your Choice of Performance

During this session the children will make the shadow puppets they will need for their performance so you will need to make a decision as to the theme and nature of the show and share this with the class (if you have not already done so). The style and theme of the show could be anything that fits in with your class learning this term. It could be that each group works on a performance of their own traditional tale (as seen in “The 3 Little Piggies”). Alternatively the story could fit in with a current topic in English, history, or any other theme (e.g. Christmas) that might lend itself to a performance. You could consider the option of a whole class performance with each group working on a different scene that fits together to make the whole show. Each group will need to know what puppets to make and don’t forget that you can also ask groups to make shadow scenery and props for the play too!