

Light up Chanukah Bag

Teacher Workbook



Your students will make:

A bag out of felt with two LEDs and a battery holder which can be used to store Chanukah candles

Equipment you will need:

- Larger pieces of felt for the bag (2 per child)
- Smaller pieces of felt for the decoration (1 per child)
- Sewing needles and thread
- Conductive thread
- Larger needles for sewing conductive thread
- Sewable coin cell battery holder (1 per child)
- C2032 batteries - these are the most common but check they work with the holder that you're using (1 per child)
- Sewable LEDs with a positive and negative side (see **Student Workbook** for image)
- Alligator clips (2 per student)

Time needed:

2 - 4 lessons

Your students will learn:

In this lesson, your students will learn how to sew LEDs on to material with Chanukah patterns. They will learn about **electricity** as well as **circuits** and how each LED has a positive and negative and the way these need to be connected to power.

Science and technology links:

Circuits: In order to make the LEDs work when the students are sewing, they need to know to connect the positives separately to the negatives. If the wires are touching or crossing their lights will not turn on.

Electricity: Students need to know that each LED uses a certain amount of power. The circuits need to be closed and connected to the battery in order to work. When there is no battery, or when the battery pack is turned off, the circuit is open and therefore won't work. When a battery is inserted the circuit is closed and the lights should turn on.

Art links:

Create and revise works of art through exploration and problem solving using a variety of media

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Lesson:

Introduction:

It is a good idea for the teacher to practice this before working with the students. Having a working example of how the circuit is sewn will help the students understand what is necessary when they are working on their own.

By the end of this unit, students should understand how LEDs are connected to power by a positive and negative side. They should also know that these two sides need to be kept separate or they could short the circuit and the LEDs won't light up.

Part One:

Before students can start on their electronics, they need to look at the design of their bag and what colors/patterns they are going to want. In this first part, students can design the front and back of their bags and can sew the designs onto the bag.

It is important at this point to remember not to sew the front and back of the bag together as it will be a lot harder to sew on the electronics.

Students can either draw their design on the front of the bag or can hot glue/sew on their designs. Students should also think about where they want their LEDs to go on the bag and where the battery pack will sit. **Note: Don't put the battery pack too far from the LEDs. The further away this is the high the chance of the electronics not working.**

Part Two:

Now that the bag is designed, it's time to look at the LEDs. Before sewing the LEDs onto the bag, show the students the + and - side of the LED, battery and battery pack. Show with the alligator clips how the positives are connected together and how the negatives are connected separately. This is the same way that they will be sewing the LEDs.

Have them test the LEDs with the battery to make sure that everything is working and to ensure they understand how the circuit works.

This is explained in the **Student Workbook**.

Part Three:

Once students understand how the LEDs connect, they can start sewing with conductive thread. This thread is thicker than regular thread and therefore tangles easily. They need to be careful to make sure that the stitches are short and tight so that the electricity follows through.

Students can work through the **Student Workbook** to complete the sewing activity.

Note: Make sure that the battery is out of the holder and/or that the battery pack is switched off. There is no danger to the students but if the battery is on/in it could short the circuit and burn out the LEDs. The battery could also stop working.