Science - Year 3

Light – Block 3L

Light and Shadows

Session 6

Resource Pack

Session 6 Teachers' Notes

Managing the Investigative Activities

During this session the children will split into two groups to carry out two investigational tasks using coloured acetates/ filters. The groups will swap after about 10 minutes, so everyone gets to do both tasks.

One task involves mixing coloured beams of light. The effect will be much easier to see in a darkened room. The other task involves looking through different coloured filters to see the effect on vision and is best done in a brightly lit classroom or even outside. If you have an additional adult it would be best for each half the class to be in a learning space suitable for their task. If you do not have an additional adult, you could create dark zones in the classroom for the light beam task by draping blackout fabric over tables (similar to the cave activity in session 2).

Coloured Acetate sheets/ Light filters

These can be bought easily from online craft suppliers. If they are relatively cheap they will probably not filter out all other wavelengths. However they will still give a good light mixing effect that is perfectly adequate for children of this age. Two acetate sheets of each colour, cut into small rectangles should provide enough for both activities.

Being Strictly Accurate

It is a common misconception that coloured "see through" materials are translucent. However, this is not so. A translucent material scatters light in all directions (e.g. frosted glass); it blurs the image so you cannot see clearly through it. A transparent material allows light to pass straight through so you can see clearly to the other side. The acetate sheets are clear (not frosted) – you could read text through them, so they are transparent rather than translucent, even though they are coloured. In the film clip, the puppeteer refers to the horse puppet as translucent and it is unclear which materials have been used so this may well be so. The red gel on the farmer's turban however is transparent. This is probably too pedantic a distinction for Year 3 children. However, if children ask about it or refer to the acetates as translucent you will be able to correct the misconception.

Light Sources

Ensure that you have good quality torches for the children to use for investigations. Choose torches with a focussed 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 coloured light mixing in a meaningful way.

YouTube film clip

There is a YouTube film clip recommended for this session. Consider downloading it ahead to avoid unsuitable or distracting advertisements popping up during the lesson.

Health and Safety

Before the children begin their shadow investigations, it is important to remind them that we are using powerful torches as a light source and that it is dangerous to eyesight if we accidentally shine a torch into people's eyes. For this reason we will only shine torches onto our A3 paper.

The Shadow Puppet Performance

As this is a primarily a science block of sessions, learning in science has taken precedence over creating and rehearsing the shadow puppet play. However, by the end of Session 6 the children should have the knowledge, skills and resources ready to develop and produce a stunning performance. If you are showcasing this to parents or other classes you will want to develop the performance element and no doubt link it in with learning in other subjects. It will be a highly motivating cross curricular outcome! Please share your outcomes with the Hamilton Blog. It is always wonderful to see how creative teachers and children run an idea.

Name or Group Name……

Light and Shadows Quiz

Question number	Answer
1	
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Light and Shadows Quiz Answers

Question number	Answer
1	B
2	A
3	C
4	B
5	C
6	B
7	C
8	B
9	A
10	C
11	B
12	C
13	B
14	A
15	C
16	C
17	B
18	C
19	A
20	B

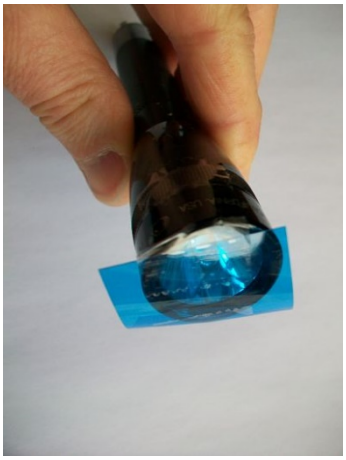
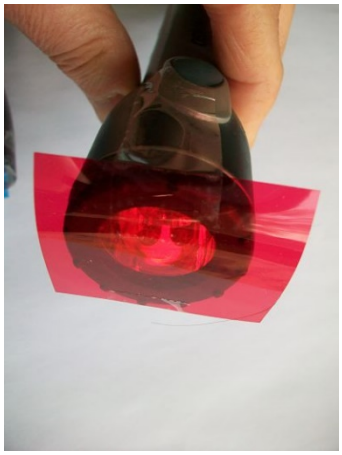
I can investigate coloured light.

Mixing Coloured Beams of Light

Work together in your group and discuss your findings

You will need:

3 bright torches, a rectangle of green, blue and red acetate, scissors, sticky tape, a sheet of A3 white paper


1. Use sticky tape to attach a rectangle of red, green and blue coloured acetate to 3 different torches. You may need to trim the acetate a little bit so it fits just over front of the torch.
2. Make sure you are working in a dark space. Switch on your torches one at a time and shine the beam on your white paper. Look at the colour of the light each torch makes
3. Now try mixing the coloured beams together so that the pool of light on the paper is made of all 3 colours. What do you notice about the colour of the mixed light? Is it what you expected
4. Now try mixing the beams of 2 torches at a time. Try each of these combinations:
   Red and blue, red and green, green and blue
   What do you notice?
   Is it what you expect?
   Does mixing coloured beams of light work in the same way as mixing coloured paint?

   If you have time, write some of your group's observations and discoveries on the back of the sheet.

I can investigate coloured light.

Investigating Coloured Filters

Work together in your group and discuss your findings

You will need:

Rectangles of different coloured acetate sheets (light filters)

1. Hold up some coloured acetate to your eyes and look through it.
2. Try looking through a red piece over each eye? What do you notice?
3. Now do the same with 2 green pieces, 2 blues and any other colours you have.
4. Now try putting a different colour over each eye. Look around you at light and dark objects. Shut one eye then the other. Now use both eyes again. What do you notice?
5. Try different 2 colour combinations
6. What happens if you put 2 different acetate colours over the top of one another and look through them?
7. Try different colour combinations
8. What if you try to look through 3 or 4 colours together?

If you have time, write some of your group's observations and discoveries on the back of the sheet