

# MAKEIT


## WORKSHOP PLAN




 national science week 2015

## PERISCOPE


See what is coming over the fence or around the corner with this simple periscope (not suitable for submarines!).

 **AGE GROUP**  
8+ (scissors and craft knife required)

 **METHOD**  
Group activity  
(14:1 participant to facilitator ratio recommended)

 **LEVEL**  
Introductory

 **DURATION**  
20 minutes

 **KEY LEARNINGS**  
Light from a source forms shadows and can be absorbed, reflected and refracted. (Yr5:ACSSU080)  
Scientific understandings, discoveries and inventions are used to solve problems that directly affect people's lives. (Yr5:ACSHE083)

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# PERISCOPE

## INCLUDED IN THIS WORKSHOP PLAN

- > Materials and equipment list
- > Preparation suggestions
- > Recommendations: General advice and opportunities for further learning
- > Full 20 minute workshop outline

## APPENDIX

- > Materials Suppliers List
- > Periscope Template

## MATERIALS AND EQUIPMENT

- Periscope template on A4 or A3 card (1 per participant)
- 50mm square acrylic mirror (2 per participant)
- Scissors (1 per participant)
- Craft knife (1 per participant)
- Ruler (can be shared between a few participants)
- Glue or sticky tape (a hot glue gun is best for fixing mirrors, if available)
- Felt pens, coloured pencils or stickers for decoration (optional)
- MATERIALS SUPPLIERS LIST (appendix)
- PERISCOPE TEMPLATE (appendix)

## PREPARATION

- > The facilitator should prepare for this workshop by making their own periscope using the instructions and materials provided. Note critical stages in gluing the device together, and advise participants accordingly.
- > If hot glue is used, note how long it takes for the glue to harden before final assembly of the tube can be done.
- > Have a rubbish bin ready for the cardboard waste.

## RECOMMENDATIONS

### GENERAL ADVICE

- > Depending on the age and skill levels of the participants, it might be wise to have a couple of extra copies of the template at hand if cutting errors make completion impossible. For this reason, it is a good idea to fix the mirrors after cutting out the template. Younger group members may benefit from assistance in fixing the mirrors to the template if hot glue is used.

### FURTHER LEARNING

- > Further learning could include designing and constructing a mega-periscope using recycled cardboard boxes (think of something that could be worn, sitting on the shoulders, or an inverted design like this). The template pattern can be enlarged and adapted to suit, however larger mirrors would be required (see appendix for possible sources).



*Required, but not included in pre-packed kits:*

- Ruler
- Scissors
- Craft knife
- Glue/Sticky tape
- Felt pens

## WORKSHOP OUTLINE



00:00

### INTRODUCTION

Introduce yourself, welcome participants and cover any housekeeping.

Ask participants if they know what a periscope is, and where it might be used.

Demonstrate the concept of inversion by having participants look at themselves in a flat mirror, and touch their right ear. Which ear is the person in the mirror touching? This shows lateral inversion (swapping left to right).

Discuss whether this could be a problem when a mirror is used in any of the examples of periscopes you identified, and suggest that this is something that could be investigated when they are finished making their own.



00:05

### PREPARING THE TEMPLATE

Distribute template cards, scissors, rulers, sticky tape, and craft knives.

Explain that the solid lines represent cuts, and the dotted lines are to be scored with the craft knife, using the ruler as a guide to get a straight line. Supervise as necessary.

Practise folding the periscope tube into shape, and point out that the mirrors will need to be fixed to the inside for it to work (this will avoid later confusion). Participants could mark where to fix the mirrors if required.

Continued...



*When the periscope is assembled the lines will be on the outside to take advantage of the scoring.*



00:15

**FIXING AND DECORATING**

Distribute the mirrors, and have participants fix them to the template with hot glue, or sticky tape.

Decoration should be done before the template is glued into a tube.

Fold the template into a tube, and glue or tape the tabs closed.

Encourage participants to work in pairs to decide if the image seen in the periscope is inverted.



00:20

**THE END**

*If tape is used, try to keep it to the edges, keeping as much of the face of the mirror as clear as possible.*

# **APPENDIX**

**MATERIALS SUPPLIERS LIST**

**PERISCOPE TEMPLATE**

## PERISCOPE MATERIALS SUPPLIERS

MATERIAL	QTY	SUPPLIER	COST	LINK
Template (on A3 card)	100	Officeworks	\$10.98 + \$5.95 shipping <\$55	<a href="http://www.officeworks.com.au/shop/officeworks/p/quill-a4-board-200gsm-white-50-pack-qubxlawe">http://www.officeworks.com.au/shop/officeworks/p/quill-a4-board-200gsm-white-50-pack-qubxlawe</a>
50x50 Acrylic Mirrors	30 (A3 cut to size)	Acrylics online	\$15.00 + \$15 shipping	<a href="http://www.acrylicsonline.com.au/shop-product/acrylic-color-sheet/acrylic-cast-silver-mirror-sheet">http://www.acrylicsonline.com.au/shop-product/acrylic-color-sheet/acrylic-cast-silver-mirror-sheet</a>

### ABOUT THIS LIST

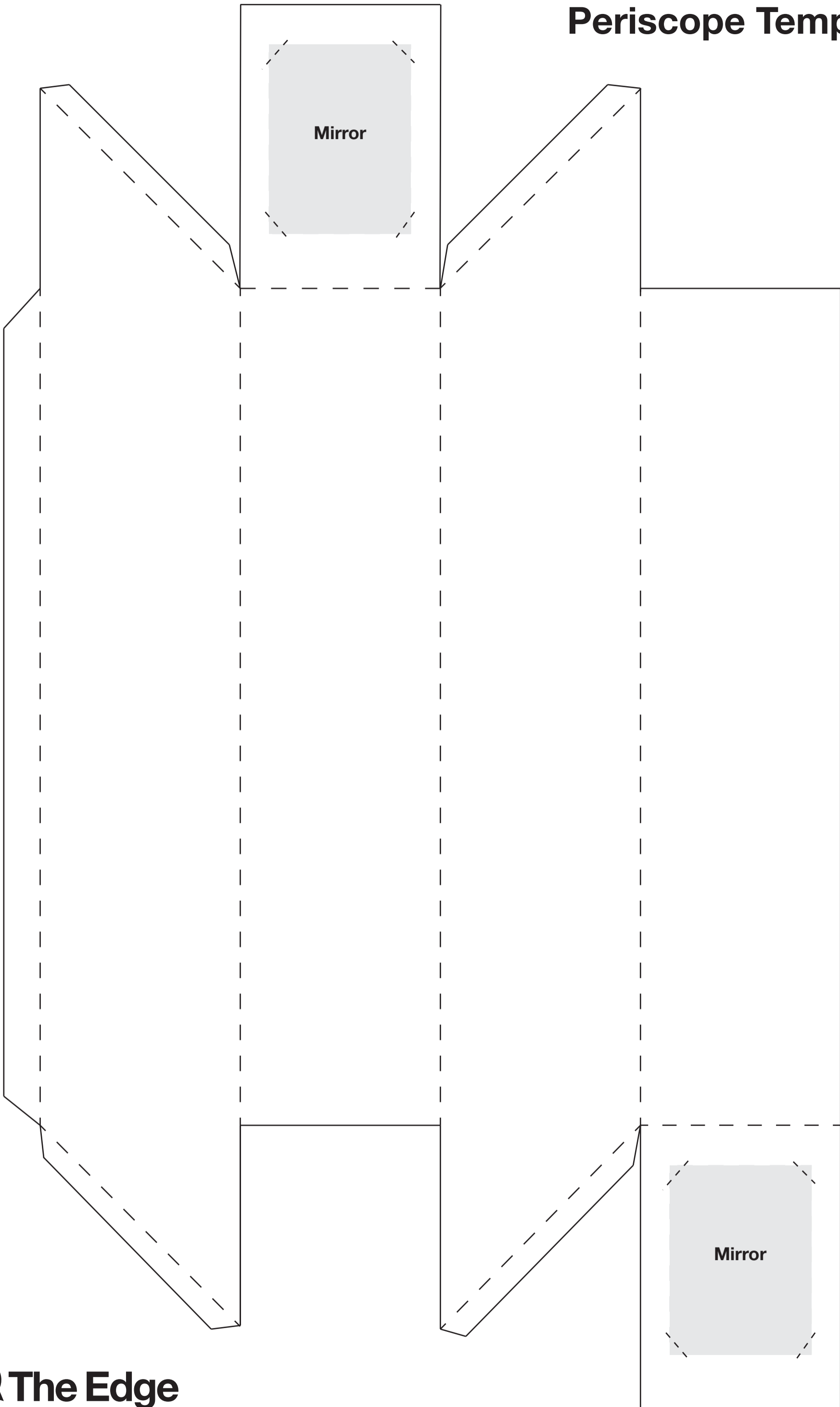
We've put this list of suppliers together to help make the planning and preparation process a little easier. We don't receive any kick-backs or benefits from sharing this list with you.

If you've downloaded this workshop plan from [edgeqld.org.au](http://edgeqld.org.au) then you'll require all the materials and equipment listed at the beginning of this document (and above).

If you've received this workshop plan through the National Science Week kits distributed by your public library, then all the above materials are supplied in the kit.

# Periscope Template

A3 SIZE





# The Edge

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[goo.gl/yBV2uw](http://goo.gl/yBV2uw)