SHADOW PUPPETS: SHINING A LIGHT ON THE TECHNOLOGY BEHIND PUPPETS

Penny Valk, B. Teaching (Primary and Secondary) student, Deakin University

Introduction

As someone with a theatre background, puppets have always been of interest to me. It is only recently that I have begun to discover that my love of puppetry can be transferred into the field of education. The link between puppetry Design, Creativity and Technology and Science is huge. There is so much scope for exploration and discovery. Puppets also make a great teaching tool as you can use them to identify students' alternative conceptions in mathematics, science and technology; concepts such as surface area, levers and pulleys and electrical circuits. Puppets and puppetry can be used for many reasons including to help a concept become less mundane or boring. Puppets are also an effective way of teaching students that working co-operatively can be painless. (Sinclair, 1995)

The following design task uses the making and performing of the Ramanyana Shadow Puppets as the stimulus for learning about various maths, science and technology concepts identified at Level 4 of the Victorian Essential Learning Standards.

This brief uses the dimensions of:

- Investigating and Designing
- Producing
- Analysing and Evaluating

The task is set out as three 100 minute lessons but this can be adjusted to suit individual classroom structures.

Activity Requirements

- 3x100 minute lessons.
- VELS Level 4.
- Students explore, design and build their own shadow puppet based on the Ramayana Shadow Puppets.
- Students create a storyline and select appropriate music for the performance.
- Students examine technological principles of levers and hinges.

Adapted progression points from VELS Design Creativity and Technology – Level 4

Investigating and Designing	Producing	Analysing and Evaluating
Generation of design ideas (labelled sketches and drawings, explanations or models) in response to a design brief.	Following a teacher demonstration, use of a range of production and finishing / presentation techniques.	Oral reflection on their design as it is developed, using teacher-prescribed evaluation criteria.

Design brief

After examining pre-made traditional Ramayana Shadow Puppets, in small groups, students are to create their own shadow puppet story. This includes designing and making the puppet and background, storyline and performance. This could include the use of music.

Technological considerations

Students should be aware of the following technical considerations and constraints when designing and building their puppets.

Process	Functionality	Creativity
Students work through the technology stages of Investigating and Designing, Producing and Analysing and Evaluating.	The puppets made need to work effectively as shadow puppets. The audience needs to see clearly who the character is.	The characters should be original and carefully thought about.

Aesthetics	Safety	Wastage
The puppets should be aesthetically pleasing and well constructed.	Students need to be given clear instruction on appropriate safety measures.	Wastage of materials should be kept to a minimum. Rough designs done on recycled paper from the class printer and consider using left over materials from one stage of the process in another stage.

Task considerations

Appropriate materials must be used such as thickness of card and stability of rods. Students must find suitable methods of joining the puppet together and also to the rod. Students must have all materials made available to them such as torches, performance space, overhead projectors etc.

Integration considerations

Science	Maths	The Arts
How is a shadow cast?	Calculation of surface area of puppet.	Creation of a longer play using puppets.
Electrical circuit in the torch.	Calculation of distance from light source and correlation to size of puppet.	Identification of different shadow puppet traditional tales in other cultures.
More in-depth discussion of pulleys and 1st 2nd and 3rd order levers	Budgeting considerations of marketing the puppet including outlay and profit.	Identification and exploration of different traditional musical instruments used in traditional shadow puppet tales.

Suggested Materials

The following list is merely a suggestion of materials that should be made available to the students. Teachers may add or remove materials at their discretion.

- Stiff card
- Bamboo skewers
- Scissors
- Sticky-tape or masking tape
- Split-pins
- Overhead transparencies
- Overhead projector
- Appropriate markers
- CD player
- Appropriate performance space (including white backing screen)

Lesson Guide

Lesson Number	Dimension	Activity / concept	Comments
1	Investigating and designing	Watch short video of traditional shadow puppets.	This is a good way of engaging students and gives them a concrete example of what is required. Complete a mind map of what students now know about shadow puppets.
		Give students the design brief and discuss.	Students contribute to and discuss their ideas on any further requirements or limitations of the design brief (as previously stated), such as working in pairs or small groups, length of presentation, number of characters etc.
Possible additional lesson		Allow students time to design their puppet and storyline.	Teacher should make appropriate resources available such as books or websites on puppetry and also be willing to help students with any questions they may have.
2	Producing	Students to commence construction of puppet and background.	Students should be reminded once more of the design brief to ensure that they remain on task. Teachers should ensure that appropriate materials are available.
		Students to begin rehearsing presentation of story.	If this project is undertaken with a large class, a timetable may be drawn up to allocate each group a fair rehearsal time with performance equipment or provide extra performance equipment.

3	Analysing and Evaluating	Talk through assessment proforma	Identify which group will be marking which performance
		Students to perform puppet shows	Allow 50 minutes for this part of the session
		Students complete peer evaluation and self evaluation of the task	
Possible additional lesson		Complete performance	Allow students to take notes, both on the performance they were assessing and on their own performance

Post-activity discussion

The following points provide a good starting point for the post activity discussion. Depending on the success and variation of the task, there may be other points teachers wish to discuss.

- The effectiveness of the puppet. Did it work?
- Any changes you might make in order to improve either the puppet or the performance.
- Constructive criticism on another group's work (this could include both technical and performance requirements from the design brief).
- What other materials could you have used?
- What limitations or allowances do we need to make for next time?
- Complete a mind-map of what students have learnt both from a technology and puppetry perspective.

Task Assessment

Diagnostic	Formative	Summative
Completion of first mind map.	Students' ability to follow the design brief correctly (includes design and production skills).	Students' ability to assess another group
Students' ability to offer suggestions to the design brief in terms of restrictions and allowances	Students' ability to work effectively in groups.	Students' ability to asses their own work.
		Students' ability to offer suggestions of improvement to the design brief.
		Completion of second mind map

Teacher reflection on the activity

I found the model quite easy to make and a lot of fun. It was interesting to learn about the different characters in The Ramayana story and the colours associated with them. Next time I would perhaps use smaller split pins and possibly paint them rather than colour them with pens.

From a technology perspective it was interesting to learn that if you want the characters to change the direction they are facing when you are projecting them, you need to keep the top of the puppet against the fabric otherwise the size of the puppet will change as it turns around.

I think that this is a great technology assignment for students at Level 4 to do. It requires them to plan and design, construct the puppet and then learn to manipulate it and this provides great integration possibilities with The Arts.

This technology task appeals to the visual and kinaesthetic learner but teachers could modify aspects of this task to cater for different learning styles such as keeping a reflective journal and incorporating movements and dance activities from other cultures which use shadow puppets.

References

The Art & Craft of Shadow Theater, 2006

http://www.youtube.com/results?search_query=The+Art+%26+Craft+of+Shadow+Theater&search=Search

Retrieved 23rd September 2007

Canadian Museum of Civilization Corporation India. The Living Arts, 2001.

http://www.civilization.ca/cultur/inde/indact1e.html

Retrieved 21st September 2007

Royal Botanical Gardens, 2005, Plant Cultures; Exploring Plants and People, Kew, Britain

http://www.plantcultures.org/schools/schools_celebrations_puppets.html

Retrieved 24th September 2007

Sinclair, A, 1995, *The puppetry handbook*, Richard Lee Publishing, Castlemaine, pp 3–6.

The V&A Museum of Childhood, unknown date, London

http://www.vam.ac.uk/moc/learning/schools/teaching_sessions/pop_ups_and_puppets/pre_visit_activities/index.html

Retrieved 20th September 2007

Victorian Curriculum Assessment Authority, Victorian Essential Learning Standards, 2007

http://vels.vcaa.vic.edu.au

Retrieved 21st September 2007