EDP4130 Assignment: Design and Technologies Resource

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Design and Technologies Resource- Unit Plan with Teacher notes

Teachers please note; Please feel free to adapt this resource to accommodate differences in your classroom/school context and style.

This resource will focus on the content descriptor; Design and Technologies Knowledge and Understanding;

• Explore how technologies use forces to create movement in products (ACTDEK002) (ACARA, 2014)



Most young children enjoy playing with push-along toys. A child can simply push the toy to see how fast and how far it will go. Or the child may move the toy in a series of movements as part of a fantasy in which they are involved. If two children play together they can push a single toy to and fro between them and if they have one toy each they can run races or develop intricate stories about the toys' adventures travelling together. There are lots of possibilities, which is why they are such popular play things. In this unit children will be designing and making a simple rolling toy for themselves or someone else.



In this unit children will learn:

• To consider the performance and appearance of rolling toys for themselves and younger children; (Session 1)

- About different sorts of rolling motion and how these can be achieved by particular arrangements of wheels and axles;
- Three different ways of fixing a tube to a paper plate; (Session 2)
- About the parts of the human face and how these create expressions; (Session 3)
- To decorate a paper plate so that it resembles a face with a particular expression; (Session 3)
- To decorate a tube so that it looks appealing when still and when it is rotating.



Technology as a Human Endeavour

Technology is part of our everyday lives and activities. It can include;

- Products including artefacts, systems and environments
- Designs for products are influenced by purpose, audience and availability of resources
- Technology and its products impact on everyday lives in different ways.



Children will design and make a simple push along toy (roly poly) using a mixture of found materials, paper and card. The toy should provide amusement in both its appearance and the ways it moves.



The children can decide on the following:





Unit Plan – How will your Roly Poly move?

Lesson	Learning Experiences	Resources	Differentiation	Assessment
Session/ Week 1 Introduce the Unit: Exploring rolling toys	 Explain to the class that each one of them is going to design and make a rolling toy and that the first step is to find out about how toys roll. Tell the class that on each table there is a different set of rolling toys including a roly poly – the sort of toy that they will design and make. Discuss ideas as to how toys roll. Look at images of rolling toys on the IWB board. Children have time to explore a variety of rolling toys as well as teacher made roly polys. The children can move from table to table in groups so they get the chance to investigate how toys roll including the different roly polys. Come together to discuss children's findings and ideas. 	 Images of rolling toys Variety of toys that roll 3 different roly polys including Racers Ditherers Wanderers Roly Poly poem (appendix 4) 	 Support- Extra support, with exploration Extension- Jot down ideas during exploration and encourage more detailed Reponses during discussions 	 ✓ Variety of ideas ✓ Participation in discussion

table, ask the class the following questions.

- What do toys need in order to be able to roll?
- Which movements did you see in the different types of roly poly?
- Which movements and decorations are likely to appeal to young children?
- a coloured pattern?
- an animal face?
- a human face?
- if a face what sort of expression happy, sad, well, ill, fierce, etc.?
- As a class, create a criteria sheet for characteristics of rolling toys.
- Discuss decorations etc. that would appeal to young children.
- Look at the roly polys and the different types of movements they make. Give each type a name.
- Consolidate the learning about movement by giving the different types of roly poly a name that describes the sort of movement they make. You can use this short poem.

Session/ Week 2 Design: Fixing Wheels	 Recap on ideas from week 1 Explain that we are going to learn 3 different ways to fix wheels to the body of a roly poly. Group children and have each group investigate the three ways. Children will need to make a decision on what way they will want to make their roly poly. Teacher to demonstrate each method- A - Dipping in PVA glue and leaving to dry B - Cutting tabs in the body and gluing C - Using a cardboard bracket Children, in pairs, have a go on their own. (One method at a time). Discuss findings, advantages, disadvantages etc 	 Thin cardboard strips Paper plates Cylinders PVA glue Scissors Roly poly specification sheet (appendix 3) 	 Support - Teacher aid Extension- Are there any other ways to attach the wheels? Which method was the quickest, longest, easiest, most difficult? Which method gave the strongest join, weakest join? 	✓ How well do the children use materials, techniques and tools?
Session/ Week 3 Design: Exploring Faces	 Explain that the roly polys will have faces as decorations. Discuss parts of the human face and how these can be used to show expressions/feelings, focusing on the eyebrows, eyes and mouth. Discuss words to describe expressions and list them on butcher's paper. 	 Paper plates PVA glue Paper cut offs and things to decorate such as glitter, eyes, 	 Support- Group with teacher aid to assist with cutting Extension- More detailed decorations 	 ✓ How well do children use materials, techniques and tools? ✓ Peer evaluation

	* * *	Show children how to decorate a paper plate so that it looks like a face, using paper cut offs etc. Each child completes a paper plate face that can be used as a basis for its roly poly design. Discuss findings and look at each other's roly poly face. Each child can evaluate a partner's design by identifying something that worked well and something that could be changed.	 sequins, features, coloured paper, stick on dots Felt tip markers Roly poly specification sheet (appendix 3) Roly poly checklist (appendix 2) 		
Session/ Week 4 Design: Exploring Body Decoratio ns	* * * *	Explain that we are going to explore ways to decorate the body of the roly poly. Show children how to glue and wind coloured material around the cylinders. Explore how this looks as it rolls. Add shiny materials that glitter as the tube rolls. Children then produce their own sample body that could be used as a basis for own design of roly poly. Discuss findings and look at each other's roly poly body. Each child can evaluate a partner's design	 Cylinders Variety of materials to decorate such as fabric, aluminum foil, metallic paper, stick on shapes, sequins, glitter. Scissors and 	 Support- support group with teacher aide to assist with cutting and gluing Extension- more detailed decorations. 	 ✓ How well do children use materials, techniques and tools? ✓ Peer evaluation

		by identifying something that worked well and something that could be changed to improve the roly poly.	× ×	PVA glue Roly poly checklist (appendix 2) Roly poly specification sheet (appendix 3)				
Session/ Week 5/6 Produce: Design and Make the Roly Poly	* * *	Explain that children are to design and produce their own roly poly over the next two weeks. They will need to decide on the following; 1. The type of movement (appendix 2) 2. Size of the tube and length 3. Appearance of wheels 4. Appearance of body 5. How the wheels will be joined to the body 6. Order to complete the above steps Children need to complete a simple production plan (roly poly checklist) which includes; * Specifications * Labelled drawing * Simple steps (appendix 3) Children to verbally or write reasons for their	A A AAAAAAA	Production Plan Sheet Variety of cylinders and cardboard tubes Paper plates Materials to decorate Coloured and white paper Range of fabrics Aluminous foil Roly poly checklist	•	Support- Work with the teacher and teacher aid Children can give a verbal response that the teacher will jot down Extension- Innovate, put things inside the tube to make noise, jagged edges, use a tin instead of cardboard tube.	*	Are the children able to produce a suitable Production Plan? How well do children use materials, techniques and tools?
	*	chosen design. E.g. "I want my roly poly to roll in a zigzag	≻	<u>(appendix 2)</u> Roly poly	С	hildren who finish		

*	path because it is lost. This is why the face on the wheel is looking puzzled. Remind children to check their design against their plans as they make them. If they make any changes, they will need to show this in their plans.	spec shee <u>(app</u>

specification sheet (appendix 3) early or who require an extra challenge might be asked to do the following.

- Investigate the effect of fixing a weight, such as a large nail, along one side of the body of a racer roly poly to see what effect this has on the way it moves.
- Investigate ways to make the roly poly make noise as it moves e.g. jagged wheels or things inside the body made from a "tin" can rather than a cardboard tube.

			 Investigate the use of paper fasteners to make the wheels on a roly poly adjustable. 	
Session/ Week 7 Reflection and Evaluatio n on the final product	 Explain that children are to evaluate the roly polys. Children will need to check that their roly poly did what they planned for it to do. Remind students that they wrote this down on their planning sheets In groups, children test and play with and complete the roly poly evaluation sheet (Appendix 4). Teacher needs to conference each child individually to complete reflection questions. 	 Evaluation sheet Reflection questions Roly poly specification sheet (appendix 3) Roly poly evaluation sheet (appendix 1). Roly poly checklist (appendix 2) 		
Session 8/Week 8 - Unit review	 Explain to the class that it is important to think about how to get better at design & technology and this can be achieved by discussing the following questions. What did you enjoy most? What did you find easy? 	 IWB Large butchers paper to jot down group ideas 	 Listen to each group and as a class make a short report on the interactive whiteboard. 	 ✓ Assist students to fill in the evaluation sheet.

 What did you find di What did you get be Did you help each of What could have bee How could these thin The children should disc groups and when they h 	 fficult? tter at? ther? en done better? ngs be done better? cuss the questions in lave finished. Coloured markers Roly poly evaluation sheet (appendix 1). Roly poly specification sheet (appendix 3) 	 The class should agree on a statement for improvement based on these reports for their next design & technology unit. 	
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Year P/1 Technology Unit – Human Endeavour Roly Poly rubric

	A Very High Standard	B High Standard	C Satisfactory Standard	D Limited Standard	E Very Limited Standard
Knowledge and Understanding			 ✓ Design is suited to purpose ✓ Design is appropriate to available skills and resources 		
Investigating and Designing			 Investigates materials, tools and techniques Communicates design intentions with a labeled drawing or verbal explanation 		
Producing			 Selects appropriate materials and techniques Plans steps in the production Identifies and uses safe practices Follows production plan to complete the product 		
Evaluating and Reflecting			 ✓ Identifies what worked well, what did not and ways to improve ✓ Reflects on learning related to the assessment 		



General Capabilities in this unit

Critical and Creative thinking	Critical and creative thinking will be encouraged through reflection and evaluation of a partner's design, by identifying something that worked well and something that could be changed.
Literacy	Students will also communicate their design intentions with a labeled drawing/diagram or verbal explanation.
Numeracy	A simple production plan that includes specifications, labeled drawings and simple steps will be encouraged.
Personal and Social capability	Working effectively in teams through group work and making responsible decisions through their planning and design on their roly poly. Students will become independent learners who can apply design thinking, technologies understanding and skills when making decisions through out the unit.

Cross curriculum opportunities in this unit

Sustainability

Students will develop an understanding on how sustainability can influence design decisions by

Fixing wheels for Session 2, 3, 4 helpful advice

Method 1

Show the children how to dip each end of the tube into PVA glue and position onto the wheels as shown below. Note the importance of

- 1. Positioning the tube centrally
- 2. Applying pressure while drying
- 3. Leaving time to dry

Method 2

Cutting tabs in the body and then gluing

Show the children how to cut small slits into each end of the tube to form tabs and to bend them out to form a gluing surface to attach the wheels. Note the importance of the following

- 1. Snipping both ends of the tube with scissors
- 2. Bending cut ends of the tube to form gluing surfaces
- 3. Applying PVA glue to each gluing surface

Appendix 1 – Roly Poly evaluation sheet



Roly poly evaluation

(Barlex, n.d).

Appendix 2 – Roly Poly Checklist

Roly poly check list

Name:	type of roly poly				
	racer	ditherer	wanderer		

(Barlex, n.d).

Appendix 3 – Roly poly specification sheet



(Barlex, n.d).

Roly Poly Poem
Three roly polys went out for the day.
Each one moved in her own special way.
One was a racer, never, ever late,
Always smooth and always straight.
One was a ditherer, fast then slow,
Never deciding how quickly to go.
One was a wanderer, left then right.
Was she going straight? No, not quite.

Appendix 4- Roly poly poem

Just imagine if you had wheels,

Where would they be fixed?

In the middle rolling straight,

Or cleverly intermixed? (Barlex, n.d).

References

Australian Curriculum, Assessment and Reporting Authority (ACARA). (2014). Australian Curriculum: Technologies. Retrieved March 2, 2015 from http://www.australiancurriculum.edu.au/technologies/rationale

Barlex, D. (n.d.). *How will your ropy poly move Nuffield design* & *technology*. Harlow: Longman.