# Integrated Design and Technology, Science and Mathematics Learning Area Unit

<table>
<thead>
<tr>
<th>UNIT TITLE:</th>
<th>Using matter.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIG QUESTION</strong></td>
<td>How can we apply our knowledge of solids, liquids and gasses to create tools for our real world?</td>
</tr>
<tr>
<td><strong>UNIT OUTLINE</strong></td>
<td>In this unit students will investigate the following questions:</td>
</tr>
<tr>
<td></td>
<td>This unit is designed to cover the following curriculum areas: Design and Technology / Science / Mathematics</td>
</tr>
<tr>
<td></td>
<td>• Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR LEVEL ACHEIEMENT STANDARD</th>
<th><strong>DESIGN and TECHNOLOGY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>By the end of Year 6, students describe competing considerations in the design of products, services and environments, taking into account sustainability. They describe how design and technologies contribute to meeting present and future needs. Students explain how the features of technologies impact on designed solutions for each of the prescribed technologies contexts.</td>
</tr>
<tr>
<td></td>
<td><strong>Students create designed solutions for each of the prescribed technologies contexts suitable for identified needs or opportunities. They suggest criteria for success and use these to evaluate their ideas and designed solutions. They combine design ideas and communicate these to audiences using graphical representation techniques and technical terms. Students record project plans including production processes. They select and use appropriate technologies and techniques correctly and safely to produce designed solutions.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SCIENCE (OR OTHER)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>By the end of Year 5, students classify substances according to their observable properties and behaviours. They explain everyday phenomena associated with the transfer of light. They describe the key features of our solar system. They analyse how the form of living things enables them to function in their environments. Students discuss how scientific developments have affected people’s lives, help us solve problems and how science knowledge develops from many people’s contributions.</td>
</tr>
</tbody>
</table>
Students follow instructions to **pose** questions for investigation and **predict** the effect of changing variables when planning an investigation. They use equipment in ways that are safe and improve the accuracy of their observations. Students **construct** tables and graphs to **organise** data and **identify** patterns in the data. They **compare** patterns in their data with predictions when suggesting explanations. They **describe** ways to improve the fairness of their investigations, and communicate their ideas and findings using multimodal texts.

### DEVELOPING INQUIRING AND REFLECTIVE LEARNERS

- Community Contributor
- Leader and Collaborator
- Effective Communicator
- Active Investigator
- Designer and Creator
- Quality Producer

### CROSS CURRICULA PRIORITIES

<table>
<thead>
<tr>
<th>Catholic Ethos</th>
<th>Aboriginal and Torres Strait Islander Histories and Cultures</th>
<th>Asia and Australia’s Engagement with Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability Education</td>
<td>Social Emotional Learning</td>
<td>Inclusive Education</td>
</tr>
</tbody>
</table>

### GENERAL CAPABILITIES

- **Literacy**
- **Numeracy**
- **Information and Communication Technology**
- **Critical and Creative Thinking**
- **Ethical Behaviour**
- **Personal and Social Competence**
- **Intercultural Understanding**
## LEARNING AND TEACHING STRATEGIES

<table>
<thead>
<tr>
<th>WEEK</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCIENCE CONTENT DESCRIPTORS</strong></td>
<td>ACSSU077</td>
<td>AC SHE081</td>
<td>AC SI S231</td>
<td>ACMSP118</td>
<td>ACM SP120</td>
<td>ACM MG 108</td>
<td>ACT DEK 023</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MATH CONTENT DESCRIPTORS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TECHNOLOGY CONTENT DESCRIPTORS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### LEARNING INTENTIONS

**Students will:**
- Understand that all matter exists in one of three states
- Explain how some common solid materials take advantage of their properties.

### SUCCESS CRITERIA

**I can:**
- Name the three states of matter.
- Answer questions about materials and their properties.

### RESOURCES

**Student Resources:**
- Can of soft drink
- Items for a mystery bag

**Teacher Resources:**
- [www.scienceweb.asta.edu.au](http://www.scienceweb.asta.edu.au)

### ACTIVITY

**FOCUS LA: Science**

This is a focus question that can guide the learning intention.

What are the defining properties of solids, liquids and gasses?

**ACTIVITY**

Introduce students to a mystery bag and explain that inside the bag are various items for them to classify as a solid, liquid or gas. Hold up an item from the bag and ask the students to describe its state of matter. Explain their thinking to their partner. Possible questions that may be posed include:
- Why do you think it is that state of matter? What features does it have? Ask students to be as specific as possible. Eg a can of soft drink may be solid, the can, liquid (contents) or gas (the bubbles).
- Create a whole class KWL chart to explore what students already know about 'Solids', 'Liquids' and 'Gases'. Make a list of questions that students have about matter. These charts will form a word wall and words/ideas will be added to it throughout the unit.

**FOCUS LA: Design and Technology**

How do some common solid materials take advantage of their properties?

**ACTIVITY**

Introduce students to some common materials such as glass, concrete, plastic, steel, aluminium and timber. Pose some logical and nonsense questions such as glass is hard and heavy so why

### ASSESSMENT OPPORTUNITIES

Create Venn diagrams, tables or other suitable data representations to classify items used and described as part of the above activities.
don’t we have hammers made from glass? Plasticene is waterproof, won’t rust and won’t bum, so why don’t we build houses from it? (This could be extended to a writing activity of creating ridiculous tools that would never work. Eg the play doh screwdriver, the saw made from rubber.

**FOCUS LA:** Mathematics
Data representation

**ACTIVITY**
Create Venn diagrams, tables or other suitable data representations to classify items used and described as part of the above activities.

**TECHNOLOGIES LANGUAGE**
Properties
## LEARNING AND TEACHING STRATEGIES

<table>
<thead>
<tr>
<th>WEEK</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCIENCE CONTENT DESCRIPTORS</td>
<td>ACSSU043</td>
<td>AC SHE083</td>
<td>AC SIS087</td>
<td>ACMMG108</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH CONTENT DESCRIPTORS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TECHNOLOGY CONTENT DESCRIPTORS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ACTDEK023</td>
<td></td>
</tr>
</tbody>
</table>

### LEARNING INTENTIONS

**Students will:**
- Develop a shared understanding of the properties of the three states of matter.
- Investigate characteristics and properties of tools.

### SUCCESS CRITERIA

**I can:**
- Name the properties of a solid, a liquid and a gas.
- Identify common tools and the properties they utilise.

### ENGAGE

**FOCUS LA: Science**

**What is the difference between a solid, a liquid and a gas?**

**ACTIVITY**

**Looking at liquids:** Introduce the concept of ‘liquids’. Brainstorm a list of ‘liquids’. List responses in the class science journal.

Ask students to think of words to describe the properties of the liquids. Prompt students with the following questions:
- Are there any liquids that don’t have water in them? Name them.
- What are some liquids that are thick, and some that are thin?

Record students’ ideas on science wall.

Teacher works through procedure of experiment with students. Students write up experiment procedure in science books highlighting the aim, materials, procedure, results and reflection.

Introduce the collected liquids and powdered laundry detergent. Explain that students will be working in collaborative learning teams to explore all of the substances to decide which are not liquids (the powdered laundry detergent is the only one that is not a liquid). Ask students to think of three or more questions that they will use when exploring the different materials.

Discuss the types of things that students might look at or do to help make their decision, such as, turning the container upside down; shaking the container; using a magnifying glass to look carefully at each material; tipping the container and

### RESOURCES

**Student Resources:**
Images of common tools including pneumatic and hydraulic and water pressure tools.

**Teacher Resources:**

**ASSESSMENT OPPORTUNITIES**

Formative assessment (technology); Mix ‘n’ Match activity.
seeing how long the substance takes to flow to the other end; pouring the substances into a new cup and observing what happens as they flow into the cup.

Students must record their responses to their questions in their ‘results’ section of their experiment procedure.

Conduct the experiment and share findings as a whole class. Add important findings to word wall/class chart.

**ACTIVITY**

**Looking at solids:** Teacher highlights the objective for the lesson: *to explore the properties of different solid materials and record student observations in a table.*

Introduce a display of a variety of solid materials (selection of solids: soap, chalk, play dough, a block of wood, a sponge, jelly snake, elastic band, marbles, flour, laundry powder, rice etc). Ask students to describe some of the properties of the samples. Record responses in science books with corresponding pictures.

Explain that students will be working in a collaborative learning team to explore some of the properties of materials that the objects are made from and compare them with properties of liquids. Teacher works through procedure of experiment with students. Students write up experiment procedure in science books highlighting the aim, materials, procedure, results and reflection.

Explain that students will be filling out a table ('Solid Science' worksheet) to record what happened to each material for each test. Discuss the purpose and features of a table. Model how to complete an entry for one of the materials.

Discuss the word 'hard' and what it means to students. Explain that scientists consider 'hard' to mean how easily a substance is scratched or worn away. For example, the hardest substance in the world is a diamond and it can only be scratched by another diamond.

Teacher works through procedure of experiment with students. Students write up experiment procedure in science books highlighting the aim, materials, procedure, results and reflection.

Complete the investigation and discuss results as a whole group. Prompt students with the following questions:

- What do the different solids have in common?
- What is different about them?
- Are powders solid? How do we know? What properties do they have in common with other solids?

Add to class science wall display.
**ACTIVITY**

**Looking at gases:** Prompt students to brainstorm different types of gases that they are aware of. Introduce the balloon. Discuss what is in the balloon and how it is a combination of several different gases including nitrogen, oxygen and carbon dioxide. Ask students if the balloon is a solid or a liquid and why they think that. Discuss how the gas in the balloon is bounded by the balloon, which is a solid. Ask students if they can think of other examples where a gas is bounded by a solid (eg: gases in a exhaust pipe, air in a basketball, air in a bicycle tube).

Introduce the transparent cup and ask students if they think there is anything inside it. Tip the cup upside down and repeat the question.

Explain that students are going to work in collaborative teams to explore the properties of gas. Teacher works through procedure of experiment with students. Students write up experiment procedure in science books highlighting the aim, materials, procedure, results and reflection.

Introduce the worksheet ‘tissues in a cup’. Read through with students and model how to complete if necessary.

Students must complete an annotated drawing to show what happened. Complete the investigation and share results with whole class.

After discussions of investigations have concluded, re-introduce the balloon. Prompt students with the following questions:

- Where would the air go if I opened this balloon?
- Where would the water go?

Update word wall/class display etc

**FOCUS LA: Design and Technology**

Look at some common tools used in the home or industry that utilise compressed air, water pressure or properties of solids.

**ACTIVITY**

Students complete a mix and match, matching images of common tools with the property they utilise (compressed air, water pressure, or the hardness of solids).
<table>
<thead>
<tr>
<th>TECHNOLOGIES LANGUAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tools</td>
</tr>
<tr>
<td>Work</td>
</tr>
<tr>
<td>Pressure</td>
</tr>
<tr>
<td>Hydraulic</td>
</tr>
<tr>
<td>Pneumatic</td>
</tr>
</tbody>
</table>
# LEARNING AND TEACHING STRATEGIES

<table>
<thead>
<tr>
<th>WEEK</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCIENCE CONTENT DESCRIPTORS</strong></td>
<td>ACSSU077</td>
<td>ACSHE083</td>
<td>AC SI5087</td>
<td>ACMNA099</td>
<td></td>
<td>ACM MG 108</td>
<td>ACTDEK023</td>
<td>ACTDEP024</td>
<td>ACTDEP025</td>
<td>ACTDEP026</td>
</tr>
<tr>
<td><strong>MATH CONTENT DESCRIPTORS</strong></td>
<td></td>
<td></td>
<td>ACMNA099</td>
<td></td>
<td></td>
<td>ACM MG 108</td>
<td>ACTDEK023</td>
<td>ACTDEP024</td>
<td>ACTDEP025</td>
<td>ACTDEP026</td>
</tr>
<tr>
<td><strong>TECHNOLOGY CONTENT DESCRIPTORS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ACTDEP027</td>
<td>ACTDEP028</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## LEARNING INTENTIONS

Students will:
- Understand that the properties of gasses and liquids can be applied to real life situations to do work.
- Understand that pneumatic and hydraulic tools take advantage of compressed air and the fact that liquids cannot be compressed to do work.
- Understand that the hardness of a solid material may make it useful as a tool.

## SUCCESS CRITERIA

I can
- Answer questions about air and water power when observing images or clips of them in action.
- Describe how air and water power may be used to do work.

## ENGAGE

**FOCUS LA: Science**
This is a focus question that can guide the learning intention.
How are gasses and liquids used to do work?
How hard is hard?

**ACTIVITY**
View the following link:
[https://www.youtube.com/watch?v=BPYkCz1q-b0](https://www.youtube.com/watch?v=BPYkCz1q-b0)
Discuss topics raised and answer relevant questions as a whole class.

## ASSESSMENT OPPORTUNITIES

### RESOURCES

**Student Resources:**
- iPads

**Teacher Resources:**
[https://www.youtube.com/watch?v=BPYkCz1q-b0](https://www.youtube.com/watch?v=BPYkCz1q-b0)
[http://www.nature.nps.gov/geology/education/concepts/minerals.cfm](http://www.nature.nps.gov/geology/education/concepts/minerals.cfm)

---

[http://www.nature.nps.gov/geology/education/concepts/minerals.cfm](http://www.nature.nps.gov/geology/education/concepts/minerals.cfm)
Students bring a range of solid materials to class and rank them from hardest to softest and then justify their rankings.

**FOCUS LA:** Design and Technology

**ACTIVITY**
Investigate characteristics and properties of a range of materials, systems, components, tools and equipment used in farming and mining. In pairs research and complete student activity sheet: Characteristics (See Appendix)
Technology extension activity: Design Challenge – Design a small vehicle that can be powered by air eg: a balloon or bicycle pump. (This activity is intended as a non-assessable activity.)

**FOCUS LA:** Mathematics
Choose appropriate units of measurement for length, area, volume, capacity and mass.

**ACTIVITY**
Students use ipads to take photos of solids, liquids and gasses. They then use a relevant app to annotate the photos, recording the appropriate unit of measurement. Estimate its measurement using the appropriate unit.

**TECHNOLOGIES LANGUAGE**
Pressure
Hydraulic
Pneumatic
## LEARNING AND TEACHING STRATEGIES

<table>
<thead>
<tr>
<th>WEEK</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCIENCE CONTENT DESCRIPTORS</td>
<td>AC SSU043</td>
<td>AC SHE083</td>
<td>AC SIS087</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH CONTENT DESCRIPTORS</td>
<td></td>
<td></td>
<td></td>
<td>ACM MG108</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TECHNOLOGY CONTENT DESCRIPTORS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AC TDEK023</td>
<td>AC TDEP028</td>
<td>AC TDEP025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AC TDEP026</td>
<td>AC TDEP027</td>
<td>AC TDEP024</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### LEARNING INTENTIONS

Students will:
- Design a vehicle or tool that uses their knowledge of the properties of matter that they have learnt this term.
- Communicate their understandings of solid, liquids and gases. Students will show this understanding by developing a set of game cards about solids, liquids and gases.
- Choose appropriate units of measurement for length, area, volume, capacity and mass.

### SUCCESS CRITERIA

I can:
- Apply my understandings of the properties of matter to design a vehicle or tool.
- Create a set of matching cards that matches an image to its description.
- Select the appropriate unit of measurement when I am designing and constructing my vehicle or tool.

### ENGAGE

**FOCUS LA: Science Assessment Activity**
Revise concepts and experiments explored throughout the unit thus far.

**ACTIVITY**
Teacher highlights the objective for the lesson: for students to communicate their understandings of solid, liquids and gases. Students will show this understanding by developing a set of game cards about solids, liquids and gases.

Students will receive a copy of the worksheet 'Matter cards'. (See appendix) Explain that one card will have the illustration of a solid, liquid or gas and its matching card will have a description of whether it is a solid, liquid or gas and three properties of the object, material or substance. Model how to complete two cards.

Provide time for the students to complete the assessment. When finished, students may join with other students to create a game of 'snap' or 'memory' etc.

**FOCUS LA: Design and Technology Assessment Activity**

### RESOURCES

**Student Resources:**

**Teacher Resources:**
Matter cards template

**ASSESSMENT OPPORTUNITIES**

Task cards is a summative assessment activity.
(See attached task and criteria sheets)
**ACTIVITY**
Design a vehicle or tool that uses your knowledge of the properties of matter that you have learnt this term. (See attached task sheet.)

**FOCUS LA: MATHS**

**ACTIVITY**
Choose appropriate units of measurement for length, area, **volume**, **capacity** and mass.

**TECHNOLOGIES LANGUAGE**
- Project plans
- Design solutions.
- Graphical representation.
- Resources.
- Lubricant
- Friction
- Coolant
- Abrasive.
- Corrosive.
- Adhesive.
**LEARNING AND TEACHING STRATEGIES**

<table>
<thead>
<tr>
<th>WEEK</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCIENCE CONTENT DESCRIPTORS</td>
<td>MATH CONTENT DESCRIPTORS</td>
<td>TECHNOLOGY CONTENT DESCRIPTORS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACSSU043</td>
<td>ACSHE083</td>
<td>ACSIS087</td>
<td>ACMMG108</td>
<td>ACTDEK023</td>
<td>ACTDEP028</td>
<td>ACTDEP024</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ACTDEP026</td>
<td>ACTDEP027</td>
<td>ACTDEP025</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LEARNING INTENTIONS**

Students will:
- Critically reflect upon their own and other students completed designs.

**SUCCESS CRITERIA**

I can:
- Complete a peer review and a self reflection responding to the set questions.

<table>
<thead>
<tr>
<th>Engage</th>
<th>Explore</th>
<th>Explain</th>
<th>Elaborate</th>
<th>Evaluate</th>
</tr>
</thead>
</table>

**RESOURCES**

**FOCUS LA**: Science / technology / maths

Have we applied our knowledge of solids, liquids and gases to create tools for our real world? Can we explain what solids, liquids and gases are and how they are measured?

**ACTIVITY**

Students and teacher establish a learning expo to showcase designs. Students complete a peer review (see attached teacher resource) of selected designs. Students complete a self reflection responding to the following questions:

- What did you think about ... at the start of the unit?
- What did we want to find out about...?
- What have you learnt about...? Why do you think that now...?
- How did you find about..?
- What activity did you enjoy the most...?
- What activity did you find the most challenging? Why?
- What are you still wondering about...?

**ASSESSMENT OPPORTUNITIES**

Peer review
Self reflection

Student Resources:

Teacher Resources:
Peer review template.
<table>
<thead>
<tr>
<th>TECHNOLOGIES LANGUAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design criteria.</td>
</tr>
<tr>
<td>Critique.</td>
</tr>
</tbody>
</table>
### Educational Modifications

#### CLASSROOM ACCOMMODATIONS
- Seat near teacher
- Assign student to low-distraction area
- Seat near positive peer models
- Use support groups / cooperative learning
- Use rows instead of tables
- Use learning centre
- Use of time-out
- Stand near student when giving instruction
- Arrange classroom for safe visibility, accessibility and movement

#### PRESENTATION OF LESSONS
- Adjust work load, reduce assignments or give alternative assignments
- Use visual aids with oral presentation
- Teacher gives student outlines or study guides
- Ensure regular lesson revisits/reviews
- Highlight instructions (marker or highlighter tape)
- Give clear behavioural objectives
- Ask student to repeat instructions for clarification and understanding
- Use high-impact game-like materials
- Call on student often
- Acknowledgment effort put forth
- Give reminders for student to stay on task, monitor student is on task/topic
- Use large type/font and dark ink
- Keep page format simple
- Use visual prompts
- Divide page into clearly marked sections
- Remove distractions from paper

#### ALTERNATIVE EVALUATION PROCEDURES
- Reduce number of items
- Practice completely similar questions
- Arrange for oral testing
- Have support staff administer test
- Permit student to type or use word processing
- Adjust grading criteria based on individual
- Adjusted grading option

#### NOTE TAKING STRATEGIES
- Provide student the means to record
- Arrange for note taker e.g. Aide
- Give student a copy of notes
- Provide time for periodic review of student’s notes (written, dictated, word processed)

#### ORGANISATIONAL STRATEGIES
- Use calendar to plan assignments
- Use of assignment notebook or work checklist especially diary
- Daily schedule
- Give time to organise desk during class
<table>
<thead>
<tr>
<th>AM check-in to organise for the day</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lunch-time check-in to organise for PM</td>
<td></td>
</tr>
<tr>
<td>PM check-out to organise for homework</td>
<td></td>
</tr>
<tr>
<td>Arrange a duplicate set of classroom material for use at home</td>
<td></td>
</tr>
<tr>
<td>Develop parent/school contract</td>
<td></td>
</tr>
<tr>
<td>Training in time management</td>
<td></td>
</tr>
</tbody>
</table>

**SUPPORT SERVICES**

| Peer tutoring | FOR WHOM |
| Cross-age tutoring |  |
| Student buddy |  |
| Work with school officer |  |
| Meet with staff during available times |  |
| Teach student to monitor own behaviour |  |
| Implement behaviour contract/reward |  |
| Self advocacy/communication skill training |  |
| Conflict resolution strategies |  |
| Other ______________________ |  |

Adapted with permission from Positive Partnerships PD Facilitators Guide
Module 5 Support materials
Appendix 3

Assessment Task Sheet and Criteria Sheet
Design and Technology Assessment Task Sheet

Student Name: ___________________________ Year Level: ___________________________

Name of Task: ___________________________ Teacher: ___________________________

Learning Area/s: ___________________________ Design and Technology

Date Commenced: ___________________________ Date Due: ___________________________

Type of Task: ___________________________ Oral □ Written □ Other

Task Conditions: ___________________________ Individual □ Pair □ Group Work

In Class □ Homework □ Other

Opportunity to Access: ___________________________ Books □ Notes □ Library □ Technology

Assessed By: ___________________________ Self □ Peer □ Teacher

Task Description (needs to include purpose and audience)

Design a vehicle or tool that uses your knowledge of the properties of matter that you have learnt this term.

Procedure (You will)

1. Brainstorm what you think you know about solids, liquids and gasses.

List your knowledge of the properties of each of the three states of matter. (solids, liquids and gasses)

You may like to list the properties in a table eg.

<table>
<thead>
<tr>
<th>SOLIDS</th>
<th>LIQUIDS</th>
<th>GASSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hardness</td>
<td>• Takes the shape of its container</td>
<td>• Have no shape</td>
</tr>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

2. What tool or vehicle do you want to design and what is its purpose?

3. List 3-5 criteria that will you to decide if your design is successful. (eg. Does your design need to be strong, fast, move a certain distance)

4. Draw a plan for your tool or vehicle. Your plan must be annotated (eg. Use arrows showing the materials you have used and brief notes explaining why you have selected those materials.)

5. Create your vehicle or tool. If you need to modify or change your original plans, make a note of this in a different colour.

Resources:
<table>
<thead>
<tr>
<th>Criteria</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Through completing this task specific criteria, students demonstrate their knowledge, understanding and skills of the achievement standard)</td>
<td>The student work demonstrates evidence of:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students invent a vehicle or tool that achieves its intended purpose and function. (thinking)</td>
<td>Create a design solution suitable for identified needs or opportunities which are clearly explained and articulated.</td>
<td>Create a design solution suitable for identified needs or opportunities which are clearly articulated.</td>
<td>Create a design solution suitable for identified needs or opportunities.</td>
<td>Create a design of a vehicle or a tool.</td>
<td>With assistance create a design of a vehicle or a tool.</td>
</tr>
<tr>
<td>Students create 3-5 criteria that would make their tool or vehicle successful. (Evaluating)</td>
<td>States and elaborates upon specific and measurable criteria for success.</td>
<td>States specific and measurable criteria for success.</td>
<td>State criteria for success.</td>
<td>With some guidance students state criteria for success.</td>
<td>Student required support to state criteria for success.</td>
</tr>
<tr>
<td>Students evaluate their own and others work against suggested criteria for success. (Reflecting)</td>
<td>Students use criteria for success to evaluate their ideas and design solutions, refine their design and explain their modifications.</td>
<td>Students use criteria for success to evaluate their ideas and design solutions and to refine their design.</td>
<td>Students use criteria for success to evaluate their ideas and design solutions.</td>
<td>Students require some prompts to use criteria for success to evaluate their ideas and design solutions.</td>
<td>Students require assistance to use criteria for success to evaluate their ideas and design solutions.</td>
</tr>
<tr>
<td>Students create an annotated plan of their design idea. (Creating)</td>
<td>Students combine a range of design ideas to communicate to audiences using graphical representation techniques and technical terms. This might include plans from more than one perspective (plan view/side view) or drawing plans to scale.</td>
<td>Students select an appropriate form to communicate design ideas to audiences using graphical representation techniques and technical terms.</td>
<td>Communicate design ideas to audiences using graphical representation techniques and technical terms.</td>
<td>Communicate design ideas to audiences using graphical representation techniques.</td>
<td>Students require assistance to communicate design ideas to audiences using graphical representation techniques.</td>
</tr>
</tbody>
</table>
## Feedback

<table>
<thead>
<tr>
<th>Signed:</th>
<th>Date:</th>
</tr>
</thead>
</table>

---

*Diocese of Cairns Catholic Education Services*
## Annotated Design and Technology Criteria Sheet.

*Red Text indicates intent of the descriptor.*

<table>
<thead>
<tr>
<th>Criteria</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Through completing this task specific criteria, students demonstrate their knowledge, understanding and skills of the achievement standard)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The student work demonstrates evidence of:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students invent a vehicle or tool that achieves it’s intended purpose and function. (thinking)</td>
<td>Create a design solution suitable for identified needs or opportunities which are clearly explained and articulated. Students state how their design meets the purpose of their vehicle or tool and clearly explain why it would be useful.</td>
<td>Create a design solution suitable for identified needs or opportunities which are clearly articulated. Students state how their design meets the purpose of their vehicle or tool.</td>
<td>Create a design solution suitable for identified needs or opportunities. Students state the purpose of their vehicle or tool.</td>
<td>Create a design of a vehicle or a tool. Students design a vehicle or tool with no useful purpose or function.</td>
<td>With assistance create a design of a vehicle or a tool. Students required assistance to design a vehicle or tool with no useful purpose or function.</td>
</tr>
<tr>
<td>Students create 3-5 criteria that would make their tool or vehicle successful. (Evaluating)</td>
<td>States and elaborates upon specific and measurable criteria for success. For example “My vehicle needs to go this fast because...”</td>
<td>States specific and measurable criteria for success. For example How fast, how long for etc.</td>
<td>State criteria for success.</td>
<td>With some guidance students state criteria for success.</td>
<td>Student required support to state criteria for success.</td>
</tr>
<tr>
<td>Students evaluate their own and others work against suggested criteria for success. (Reflecting)</td>
<td>Students use criteria for success to evaluate their ideas and design solutions, refine their design and explain their modifications. Students return to their original design, make</td>
<td>Students use criteria for success to evaluate their ideas and design solutions and to refine their design. Students return to their original design and make modifications after</td>
<td>Students use criteria for success to evaluate their ideas and design solutions.</td>
<td>Students require some prompts to use criteria for success to evaluate their ideas and design solutions.</td>
<td>Students require assistance to use criteria for success to evaluate their ideas and design solutions.</td>
</tr>
<tr>
<td>Students create an annotated plan of their design idea. (Creating)</td>
<td>Students combine a range of design ideas to communicate to audiences using graphical representation techniques and technical terms. This might include plans from more than one perspective (plan view/side view) or drawing plans to scale. Students have created several simple plans from different angles and/or scale of their design that includes appropriate labels and captions.</td>
<td>Students select an appropriate form to communicate design ideas to audiences using graphical representation techniques and technical terms. Students have created a simple plan of their design that includes appropriate labels and captions and articulate why they have selected a particular form to present their plan.</td>
<td>Communicate design ideas to audiences using graphical representation techniques. Students have created a simple plan of their design that includes appropriate labels and captions.</td>
<td>Communicate design ideas to audiences using graphical representation techniques. Students require assistance to communicate design ideas to audiences using graphical representation techniques.</td>
<td></td>
</tr>
<tr>
<td>CHARACTERISTICS</td>
<td>NAME OF EQUIPMENT TOOL MACHINERY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PURPOSE (WHAT IT IS USED FOR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROPERTIES (IS IT A GAS OR A LIQUID? WHAT PROPERTIES DOES IT UTILISE?)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHARACTERISTICS (WHY HAS THIS PARTICULAR SOLID, LIQUID OR GAS BEEN USED RATHER THAN ANOTHER?)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Images for Mix and Match Activity
Learning with Faith and Vision
Science Assessment Task Sheet

Student Name: Year Level:

Name of Task: Teacher:

Learning Area/s:
Science

Date Commenced: Date Due:

Type of Task: □ Oral □ Written □ Other
Task Conditions: □ Individual □ Pair □ Group Work
□ In Class □ Homework □ Other

Opportunity to Access:
□ Books □ Notes □ Library □ Technology

Assessed By: □ Self □ Peer □ Teacher

Task Description (needs to include purpose and audience)
You will communicate your understandings of solid, liquids and gases by sorting a set of game cards into the appropriate category solid, liquid or gas and justifying your placement.

Procedure (You will)
- Collect your copy of the worksheet ‘Matter cards’.
- Each of your cards will have an illustration of a solid, liquid or gas.
- Look at each picture and make a judgement about which category (solid, liquid or gas) you wish to place it in.
- Justify why you have sorted the images into the categories you have. Remember to refer to the properties of each of the three states of matter.
- Record you reasoning.

Resources:
- Visual cards
- sorting template.
# SCIENCE CRITERIA SHEET

<table>
<thead>
<tr>
<th>Criteria</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Through completing this task specific criteria, students demonstrate their knowledge, understanding and skills of the achievement standard)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The student work demonstrates evidence of:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make a judgement about the category (solid, liquid or gas) you wish to place each picture in.</td>
<td>Can classify substances according to their observable properties and behaviours with 100% accuracy.</td>
<td>Can classify substances according to their observable properties and behaviours with greater than 75% accuracy.</td>
<td>Classify substances according to their observable properties and behaviours.</td>
<td>Can classify substances according to their observable properties and behaviours with less than 50% accuracy.</td>
<td>Can classify substances according to their observable properties and behaviours with less than 25% accuracy.</td>
</tr>
<tr>
<td>After making a judgement, justify why you have sorted the images in to the categories you have. Remember to refer to the properties of each of the three states of matter.</td>
<td>Compare patterns in the data when suggesting explanations. These explanations analyse the properties of the matter.</td>
<td>Compare patterns in the data when suggesting explanations. These explanations refer to the properties of the matter.</td>
<td>Compare patterns in the data when suggesting explanations.</td>
<td>Beginning to compare patterns in the data when suggesting explanations.</td>
<td>Requires support to compare patterns in the data when suggesting explanations.</td>
</tr>
<tr>
<td>Helium</td>
<td>Milk</td>
<td>Glass jar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Helium" /></td>
<td><img src="image" alt="Milk" /></td>
<td><img src="image" alt="Glass jar" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ice</td>
<td>Honey</td>
<td>Diesel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Ice" /></td>
<td><img src="image" alt="Honey" /></td>
<td><img src="image" alt="Diesel" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheese</td>
<td>Paint</td>
<td>Sugar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Cheese" /></td>
<td><img src="image" alt="Paint" /></td>
<td><img src="image" alt="Sugar" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air inside a tyre.</td>
<td>Soft drink.</td>
<td>Cement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image1.png" alt="Air inside a tyre" /></td>
<td><img src="image2.png" alt="Soft drink" /></td>
<td><img src="image3.png" alt="Cement" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid</td>
<td>Liquid</td>
<td>Gas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>-----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>