Respectful Relationships: Problem-solving

Levels 5-6

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# Topic: Problem-solving

# Levels 5-6

# Victorian Curriculum F–10

## Critical and Creative Thinking

### Content Description

Investigate how ideas and problems can be disaggregated into smaller elements or ideas, how criteria can be used to identify gaps in existing knowledge, and assess and test ideas and proposals [(VCCCTM031)](http://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCCCTM031)

### Achievement Standards (excerpt only)

By the end of Level 6, students… disaggregate ideas and problems into smaller elements or ideas, develop criteria to assess and test thinking, and identify and seek out new relevant information as required.

# Teaching and learning activities

The Department of Education and Training have developed [*Level 5-6 Resilience, Rights and Respectful Relationships*](http://fuse.education.vic.gov.au/Resource/LandingPage?ObjectId=b74ae78a-995a-4a73-8361-3a200d448bd7) teaching and learning materials. The following teaching and learning activities are designed to teach the knowledge, skills and understandings relating to problem-solving for the Level 5-6. The following activities are located on page 34 to 42.

Activity 1: We have a problem, how can we deal with it?

Activity 2: Exploring what works

Activity 3: Problem-solving panel

## Additional activities addressing the Content Description for Levels 5-6

### Activity 4: Disaggregating a problem

Explain to students that two key parts of solving a problem are to break the problem into smaller parts and then think about the options you will need to consider addressing each part of the problem. Explain that today we will be practising these skills.

Provide students with a complex or multifaceted problem to solve such as:

**Problem scenario**

Your friend cheated in their maths test. They tell you they did not have time to do their maths homework because they were too busy looking after their little brother while their parents were working.

Divide the class into small groups. Ask each group to:

* break the problem into smaller parts
* brainstorm for a range of options for each part of the problem
* identify any additional information required to solve the problem
* identify the positive and negative outcomes for each option
* provide reasons as to which would be the best strategies to solve the problem.

Groups could record their ideas in a concept map and use this to share their thinking with the rest of the class. Encourage class members to ask questions about the strategies selected and the reasons for choosing these.

Students could use concept mapping software such as SmartDraw, Visio, [Webspiration Classroom](http://www.webspirationclassroom.com/), Cmap, Inspiration, MindManager, [Mind42](http://mind42.com/), [MindMeister](http://www.mindmeister.com/), Mindomo, [Bubbl.us](http://bubbl.us/), or [FreeMind](http://freemind.sourceforge.net/wiki/index.php/Main_Page) to develop their concept map.

### Activity 5: Creating and using criteria

Pose the question to students, ‘How do we know if we have made the right choice when solving a problem?’. Ask students to:

* Think – reflect on their answer to the question
* Pair – discuss their ideas with a partner
* Group – two pairs join to form a group and discuss their ideas
* Share – groups report back to the class providing their response to the question.

Record student ideas, grouping similar ideas together.

Write the word ‘criteria’ on the board and discuss with students what the term means and why criteria might be used. Tell students that they are going to write some criteria to assess the choices they make in solving problems.

Use these criteria to review the choice of strategy in Activity 4.

# Assessment ideas

## Pre-assessment

### What do you already know?

Ask students to write an example of a problem that they or a friend have faced recently and a strategy they used to deal with it.

Refer to the Assessment Rubric on page 3 to identify where students are located on the Victorian Curriculum F–10 continuum.

## Ongoing formative assessment

### Problems and Solutions

Ask students to identify the problem in a scenario and identify possible solutions. Assess students’ ability to identify problems and name possible solutions.

Complete Activity 2: Exploring what works. Use this as a basis to assess students’ understanding of various strategies and how they support problem-solving.

Ask the students to answer the three questions based on another peers’ role play (*In what ways did the chosen strategy help the person deal with the problem? In what ways could it have been done differently? What other options might work?*). Use these answers to assess their understanding of when to use various strategies.

## Summative Assessment

### Creative solutions

Students write up a problem scenario they have faced recently in which they feel they could have dealt with it more effectively. Students then create some creative problem-solving solutions that they could have tried and could use if the situation arises again in the future. (Based on Activity 3)

Extend students by getting them to consider a current problem in the World and how they would identify solutions using information from different professionals. E.g. To deal with gun control in the US you could access the knowledge of psychologists or manufacturers in creating a solution to the problem.

Refer to the Assessment Rubric on page 3 to identify where students are located on the Victorian Curriculum F–10 continuum.

# Problem-solving assessment rubric – Levels 5-6

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Relevant element of the Achievement Standards** | | | | |
|  | **Level 4** |  | **Level 6** |  | **Level 8** |
|  | **Critical and Creative Thinking** | | | | |
|  | **By the end of Level 4**, students … select and apply a range of problem-solving strategies. |  | **By the end of Level 6,** students … disaggregate ideas and problems into smaller elements or ideas, develop criteria to assess and test thinking, and identify and seek out new relevant information as required. |  | **By the end of Level 8,** students … independently segment problems into discrete stages, synthesise new knowledge at intermediate stages during problem-solving and develop and apply criteria to assess ideas, proposals and emerging thinking. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Assessment Rubric** | | | | |
| **Category** | **At Level 4 students can:** | **When progressing towards Level 6 students can:** | **At Level 6 students can**: | **When progressing towards Level 8 students can:** | **At Level 8 students can:** |
| Problem-solving approaches | * suggest a range of strategies to solve a problem and select one that they think is most appropriate to the situation | * explain and justify different strategies to solve a problem | * break a problem into smaller parts * use criteria to assess different strategies that could be used to solve a problem | * break a problem down into discrete stages * use information to inform the selection of options when solving problems * use criteria to assess the appropriateness of different strategies that could be used to solve a problem | * independently break a problem down into discrete stages * gather and use relevant information to inform the selection of options when problem solving * develop and apply criteria to assess possible options to solve problems |