

TAKING THE COMPLEXITY OUT OF CONCEPTS

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CHAPTER 1: THE WHAT AND WHY OF CONCEPTUAL LEARNING

We might ask, as a criterion for any subject taught in primary school, whether, when fully developed, it is worth an adult's knowing, and whether having known it as a child makes a person a better adult. If the answer to both questions is negative or ambiguous, then the material is cluttering the curriculum.

— Jerome Bruner (1960, p. 52)

WHAT IS A CONCEPT?

According to H Lynn Erickson (2008, p. 30), a concept is 'a mental construct that is timeless, universal, and abstract.' In the world of education, a concept acts as an umbrella, linking together all the details and characteristics that form the constituent parts of that idea. Because they reveal the relationship between seemingly discrete pieces of knowledge, concepts enable learners to organise and scaffold their learning and thinking in a way that is directed towards stronger understanding. A concept can typically be expressed in a single word or a phrase, such as power or points of view.

Traditionally, educators have taught through content as opposed to concepts. In this context, content is defined as discrete pieces of factual information that can be observed and verified. When students memorise the capital cities of Europe, the dates of key events in World War II or the names of Australia's native animals, they are learning through content.

Yet while factual information is important, it does not guarantee that learners will draw on this knowledge use it and apply the content in meaningful ways. Kip Téllez (n.d.) points out that while 'facts are crucial to overall knowledge development', when taken alone they 'do not generalize well. They are specific to the context in which they are taught'. But factual content can also be taught through a conceptual framework, which emphasises both depth and breadth of understanding.

What the IGE model provides is a structured process that guides teacher dialogue with the aim of identifying understanding goals, extracting concepts from within these goals and then developing a conceptual understanding. A blank version of the model is available for download at go.hbe.com.au.

HOW TO USE THE IGE MODEL FOR FORMULATING CONCEPTUAL UNDERSTANDINGS

In this section, we provide a detailed run-down of how to complete each step of the model in order to highlight the conceptual elements within curriculum content. The process should conclude with the development of an overarching conceptual understanding that drives teaching and learning.

At the commencement of a unit of instruction, students can be presented with the concepts, understanding goals and conceptual understanding that have been developed using the IGE Model for Formulating Conceptual Understandings. If students are particularly well-versed in conceptual learning practice, teachers may even like to solicit their input when completing the steps of the model.

STEP 1: CONTENT

The first step of the IGE Model for Formulating Conceptual Understandings is to identify the curriculum content that will be the starting point for conceptual understanding. When completing this step of the model, educators should list the standards, objectives and descriptors that they wish to cover in the unit.

Each of the five case studies for this chapter is based on a single content description from the Australian Curriculum. But the model works equally well with any mandated curriculum requirements or other school-designed curriculum. For examples of conceptual understanding that incorporate content descriptions from across the Australian Curriculum, see the case studies included in Chapter 5 of this book (pp. 53–80) to demonstrate the IGE Template for Planning Conceptual Learning.

STEP 2: PURPOSE

Before the conceptual understanding for a unit can be established, the following questions are vital. Their aim is to determine the value and purpose of the learning, as this will guide the development of understanding goals, concepts and finally the conceptual understanding.

- **Why is the unit compelling?** Compelling refers to the level of interest the unit has for the students who will be learning it. This question asks teachers to think about the 'why' for learners by looking at it through the eyes of the student. Why would a student be interested in learning about this?

PROCESS	GUIDING QUESTIONS
Inquiry as connection	<ul style="list-style-type: none"> • What is compelling and significant in the world of my students? • How can I help students to uncover personal connections between their own lives and the concepts driving their learning? • What resources will encourage students to connect to the concepts?
Inquiry as provocation	<ul style="list-style-type: none"> • How will the provocations I have designed engage students in the concepts? • How will the provocations help me to ascertain student's prior knowledge? • What resources should I use to provoke student curiosity?
Inquiry as critical wondering	<ul style="list-style-type: none"> • What do students most want to know? What are the key questions arising from their wonderings? • What do students' wonderings reveal about their grasp of the conceptual understanding of the unit? • How will student's critical wonderings be collected or recorded? • How will students' critical wonderings be embedded in the inquiry?
Inquiry as investigation	<ul style="list-style-type: none"> • Have I identified a critical conceptual question or wondering? • Do I have a plan to guide the process of conceptual investigation? • What learning engagements will enable my students to work towards conceptual understanding? • Do these learning engagements utilise a range of real-world resources?
Inquiry as reflection	<ul style="list-style-type: none"> • What is the most significant idea that students have connected to? What prompted them to make this connection? • What is it students still want to understand or know? • At what level is students' current understanding of the concepts, understanding goal and conceptual understanding?
Inquiry as representation	<ul style="list-style-type: none"> • What are some of the mediums in which students could represent their learning? • Do students have the skills and understanding necessary to communicate their new knowledge to peers? • How will others be able to access the students' ideas or new findings?
Inquiry as transformation	<ul style="list-style-type: none"> • What are the big ideas students have gained from the inquiry? • What unexpected connections have students made during the inquiry process? • How has what students have learnt made a difference in their lives? • How can students use their new understanding to make a better world?

Table 3.2 Guiding inquiry questions for teachers

ASSESSING UNDERSTANDING GOALS FORMATIVELY

To assess student learning formatively, educators develop ‘learning engagements’, also referred to as ‘performances of understanding’:

Performances of understanding help students build and demonstrate their understanding. Although a ‘performance’ might sound like a final event, performances of understanding are principally learning activities. They give both you and your students a chance to see their understanding develop in new and challenging situations over time. (Blythe & Associates 1998, pp. 62–63)

Once the understanding goal and levels of understanding have been established, teachers can brainstorm learning engagements that will help them to monitor a student’s level of understanding. Table 4.1 contains a list of suggested learning engagements for each level that can be undertaken individually, as a group or even as a peer assessment task. The evidence gained from the learning engagements provides specific and helpful feedback for students and teachers in order to assist them in building the levels of understanding.

As an example, consider a Year 5 unit on digital citizenship with the following understanding goals:

- Identify different types of digital media.
- Describe the ways we use digital media as a tool for expression.

These understanding goals have been combined in a single continuum because in order to understand the ways digital media is used as a tool for expression, the students first had to explore all the different types of digital media. Table 4.2 (p. 50) represents the learning continuum a teacher might devise for these understanding goals.

ASSESSING UNDERSTANDING GOALS SUMMATIVELY

A summative assessment task should clearly demonstrate evidence of each student’s understanding. In order to ensure that the summative task is closely connected to the understanding goals, it may be worth brainstorming a few summative assessment tasks that can be reviewed as the unit progresses. It is important to note that you do not necessarily need a summative assessment for each understanding goal, as a single summative assessment may include two or more understanding goals.

Many teachers design summative assessment tasks that assess skills or knowledge rather than understanding. During IGE’s work with educators, teachers have repeatedly stated that using the levels of understanding significantly helped to clarify what they were looking for with regard to student mastery. For example, a music teacher commented, ‘I can already see where some of my students are along the levels, which is great as I now know where to go next’.

<p>Inquiry as critical wondering</p>	<p>Student questions and wonderings are documented in this section. These need to be authentic and related to the unit. The questions are incorporated into the ongoing planning of the unit.</p> <p>To learn more about the processes of conceptual inquiry, see Chapter 3: Conceptual Learning and Inquiry (pp. 33–45).</p>
<p style="text-align: center;">Step 2: Planning as the unit progresses</p>	
<p>Inquiry as investigation, representation, reflection and transformation</p>	<p>Using evidence of understanding from Stage 2 of the planning template along with students’ critical wonderings, teachers determine the next stages of planning. The resulting learning engagements evolve and in response to students’ understanding of the conceptual focus of the unit and their application of skills and knowledge.</p> <p>To learn more about the processes of conceptual inquiry, see Chapter 3: Conceptual Learning and Inquiry (pp. 33–45). Teachers can also reference the levels of understanding for the unit (see Chapter 4, pp. 47–52) to develop relevant learning engagements.</p>

STAGE 4: EVIDENCE-BASED REFLECTION

This section is completed as an ongoing reflection of the unit. It is important that student voice is incorporated into this section. The reflection is used to assist with ongoing planning.

Table 5.3 Explanation of the IGE Template for Planning Conceptual Learning (3 of 3)

CASE STUDIES OF THE IGE TEMPLATE FOR PLANNING CONCEPTUAL LEARNING

CASE STUDY 1 HABITATS UNIT YEAR 1

Habitats is a key topic for science in the lower primary years. In discussion with many teams about the planning for this unit, it became clear that real-life investigations were being compromised to focus more on research from non-fiction texts and videos. After lengthy discussion as to the value of teaching young children to observe and annotate their scientific observations, it became evident that the teachers needed to think differently in order to map a more investigative and authentic conceptual inquiry.

The unit in Table 5.4 below is a combination of ideas from a few different teams with whom IGE has worked. It demonstrates how to make the shift from habitats as a topic to a conceptual unit that involves in-depth firsthand inquiry. The unit includes several local field investigations in order to support the inquiry.

- Does the concept change in different situations?
- How does the concept connect to your own life?
- What is the most important thing to understand about the concept?

➤ **Pass-it-on.** The teacher writes several questions about the concept on large sheets of paper. Students work in groups to answer the questions, writing as much as they can. The teacher then says 'Pass' and the paper is passed to the next group, who read what was written and add more ideas. This continues until each group has their original piece of paper back. The idea is that each time students have to add to others' responses, they are made to think more deeply about their own view of the concept.

➤ **Concept walk.** The teacher places around the classroom a variety of words, objects, photos, pictures and ideas that relate to the concept. Students walk around the room looking at these items and record the ideas and thoughts about the concept that arise from their walk.

➤ **Concept headline.** The teacher prompts students to display their understanding of the concept by asking, 'If you were to write a headline that captures what is most important about the concept, what would that headline be?' Follow-up questions can then be asked to probe how students' ideas about the concept have changed over the course of the unit: 'How has your headline changed based on today's discussion? How does it differ from what you would have said yesterday?' (adapted from Visible Thinking n.d.b).

➤ **Diamond display.** Prepare a set of nine different statements or opinions about the concept. The statements should vary in point of view and, if possible, incorporate various generalisations that students themselves have made about the concept. Each statement should be written on its own square of paper.

Once the statements have been handed out, students work either in small groups or individually to arrange them in a diamond shape. The statement at the top is the one they agree with the most. The next line has two statements, then three, then another two, all arranged in order of priority until the last statement – the one they least agree with – is placed at the bottom. The resulting diamond is shared with others, and students are given the opportunity to justify their opinions.

➤ **True/false/not sure.** Working individually or in small groups, students are given statements relating to the concept. They have to decide if the statements are true or false and state why they think this, then they discuss their reasoning in comparison with that of others.

➤ **Concept wall.** The concept is written in the centre of a sheet of poster paper and hung on the wall. Throughout the unit, students can add ideas and statements about the concept, draw pictures related to the concept, find and place pictures related to the concept, write words related to the concept and post questions that they have about the concept. This enables the teacher to gain an understanding of what students do or do not know, in this way functioning as a formative tool throughout the unit.