

Concept-Based INQUIRY IN ACTION

Strategies to Promote
Transferable Understanding



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Foreword by H. Lynn Erickson and Lois Lanning

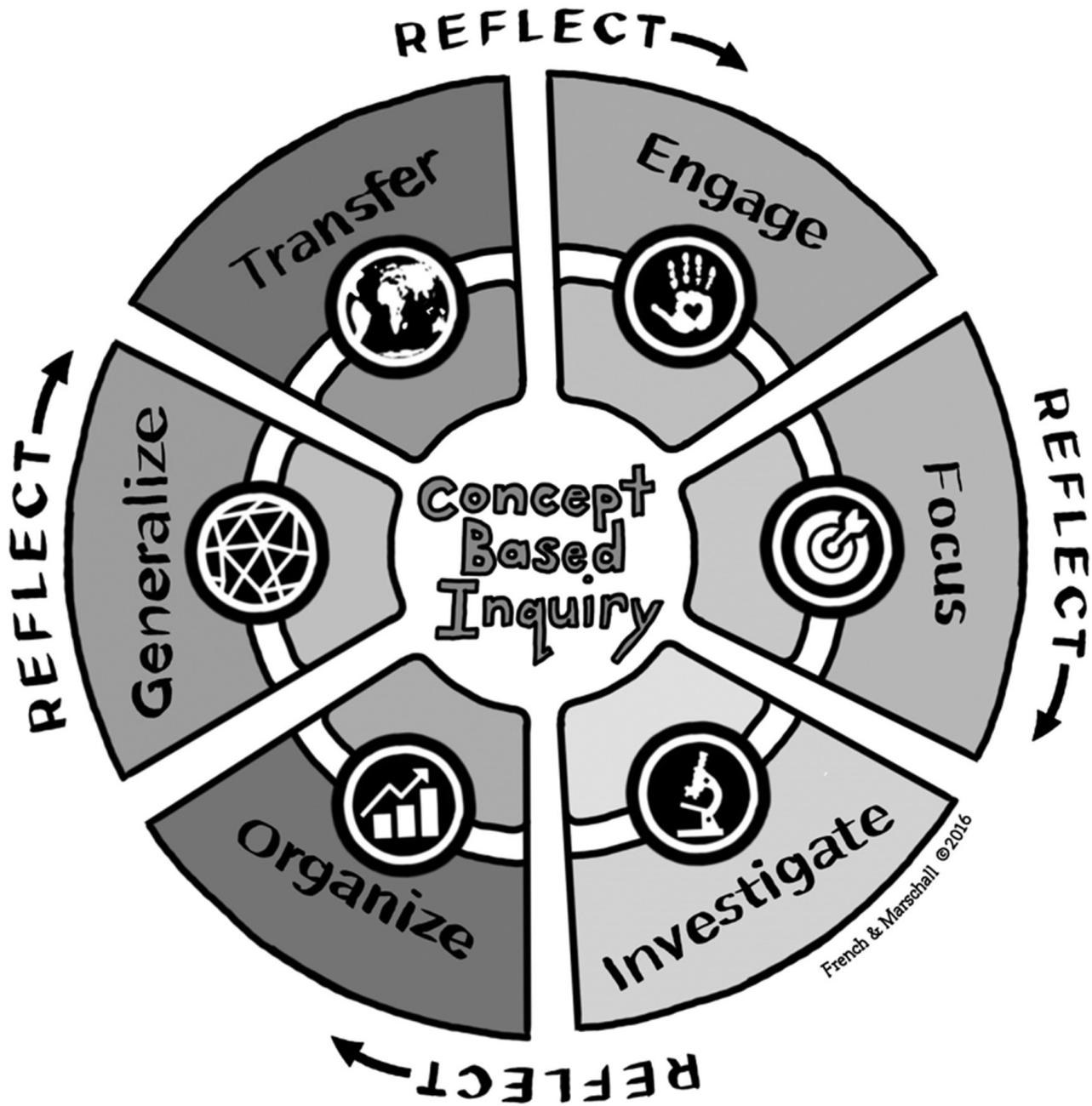
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Please enjoy this complimentary excerpt from *Concept-Based Inquiry in Action* by Carla Marschall and Rachel French. Discover in this resource the phases of concept-based inquiry and how they are interconnected to support learning transfer.

LEARN MORE about this title, including Features, Table of Contents and Reviews.

FIGURE 2.1 THE CONCEPT-BASED INQUIRY MODEL



NOTE: A color version of this model is available for download via our membership site, www.connectthedotsinternational.com/members-only

TABLE 2.1 THE PHASES OF CONCEPT-BASED INQUIRY

Phase of Inquiry	Purpose
Engage 	<ul style="list-style-type: none"> To engage children emotionally and intellectually in the unit To activate and assess students' prior knowledge To invite initial student questions
Focus 	<ul style="list-style-type: none"> To develop a shared understanding of the unit's driving concepts using concept formation strategies To introduce relevant factual examples that may be explored further in the Investigate Phase of inquiry
Investigate 	<ul style="list-style-type: none"> To explore factual examples, or case studies, and connect these to unit concepts To expand student understanding of unit concepts by providing case studies that introduce complexity and/or raise additional questions To acquire disciplinary and interdisciplinary skills
Organize 	<ul style="list-style-type: none"> To organize thinking at both the factual and conceptual level To represent concepts and ideas using different materials, media, and/or subject areas To recognize and analyze skills in context
Generalize 	<ul style="list-style-type: none"> To form connections and locate patterns across factual examples To articulate, justify, and communicate generalizations
Transfer* 	<ul style="list-style-type: none"> To test and justify the validity of generalizations To apply generalizations to new events and situations To use experiences and understandings to form predictions and hypotheses To take meaningful action on one's learning
Reflect** 	<ul style="list-style-type: none"> To build students' sense of personal agency To enable students to plan and monitor their learning process To individually and collectively evaluate learning progress during and at the end of an inquiry

*Often extends beyond the time spent on a unit in the classroom

**Embedded into all phases of inquiry

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The Phases of Concept-Based Inquiry

Engage



Fundamental to an inquiry approach is engaging student interest in a topic and connecting with learners' own experiences and prior knowledge. This phase of inquiry sets the stage, defining the scope of learning that follows. During the Engage Phase, the topic of study and unit concepts are introduced in a manner designed to spark student interest. The goal is to engage students emotionally and intellectually, so they feel invested in the inquiry and want to find out more. By activating their prior knowledge, students are able to make initial connections to a particular topic or set of concepts. This includes sharing questions they may already have. Learning experiences that provoke students' thinking and curiosity are employed for this purpose, providing teachers with an opportunity to step back, observe, and gather valuable assessment information. Chapter 4 considers what emotional and intellectual engagement looks like in the Engage Phase of inquiry.



Photo 2.1 The Engage Phase in Action

Students sort, group, and name questions in their IB Higher Level Chemistry class during the Engage Phase of inquiry (see Chapter 4, p. 116).

SOURCE: Julia Briggs

Focus



Once students are engaged in a unit, concept formation strategies are employed to develop an understanding of the unit's **conceptual lens** and **driving concepts**. Addressing concept formation early in a unit has multiple benefits. First, it ensures that all children have a shared understanding of the unit's driving concepts. This prepares students for thinking to come. As students work with knowledge and skills in the Investigate Phase, they stretch and expand their initial understanding of unit concepts.

Second, focusing on concept formation allows teachers to address misconceptions uncovered in the Engage Phase that may hinder the development of generalizations later in the unit. In a unit on forces, for example, if some students think that movement must occur for a force to act on an object, this could hamper their ability to create an accurate generalization. As Concept-Based practitioners, we need to be explicit about the essential attributes of unit concepts and use appropriate examples and non-examples to help students shape their thinking.

Lastly, but just as important, by being clear about our unit concepts and addressing these through our instructional strategies, we can ensure alignment between our concepts, our factual examples, and the generalizations we would like children to develop. By being reflective and working backward from our generalizations, we can plan learning engagements that take children to the conceptual level of thinking. Chapter 5 provides an in-depth look at the Focus Phase of inquiry.



Photo 2.2 The Focus Phase in Action

Students take part in a Spectrum Sort using a clothesline to understand the concept of repeated addition in the Focus Phase of inquiry (see Chapter 5, p.128).

Investigate

After ensuring a common understanding of the conceptual lens and driving concepts, children are ready to conduct their own research. The Investigate Phase invites students to explore a range of factual examples or skills, which connect to unit concepts. This research phase of the inquiry may involve individual, small-group, or whole-class investigations. Depending on the amount of structure within a unit, investigation may take different forms. At times, the class may collectively examine the same **case study**. During other inquiries, students may choose their own to research within the context of the broader topic. As students learn about a particular topic, teachers maintain a dual focus on the both acquiring factual knowledge and the development of skills and strategies to ensure





Photo 2.3 The Investigate Phase in Action

Students use microscopes to learn about the formation of crystals in substances during the Investigate Phase of inquiry (See Chapter 6, p.154).

SOURCE: David French

the research process is successful for students. Chapter 6 describes ways to organize and support student research in the Investigate Phase of inquiry.



Organize

The Organize Phase gives students the chance to structure their thinking at both the factual and conceptual levels, while beginning to explore patterns in their findings. During this stage of inquiry, students organize data gathered in the Investigate Phase. This is an important step for students, as making sense of information using tools such as graphs, charts, or maps enables children to start seeing commonalities across case studies. Organizing findings allows the class to access content more easily and reduces cognitive load. This step supports the development of generalizations in the next phase of inquiry.

At the same time, students are given the opportunity to represent concepts acquired in the Focus Phase through different media and/or subject areas. This enables students to



Photo 2.4 The Organize Phase in Action

Following an investigation, students organize materials based on their properties using a Venn Diagram.

SOURCE: Gayle Angbrandt

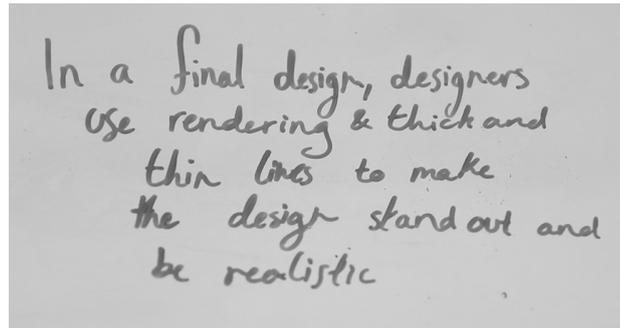
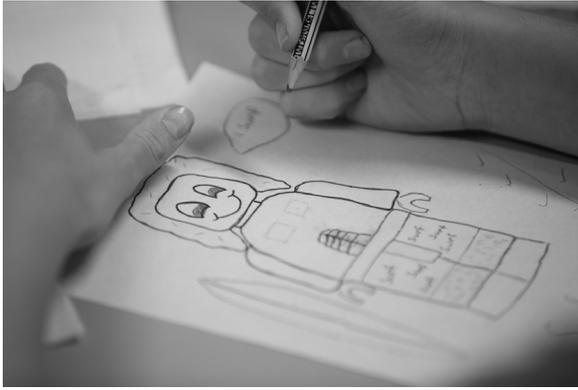
consolidate their thinking about unit concepts. For example, a third-grade unit on multiplication may provide children with experiences to represent the concept of an *array* through drawing or with objects. Opportunities to represent findings encourage students to reflect on a concept's essential attributes and how these can be depicted in divergent ways. Chapter 7 explores in detail how teachers can help students organize and represent their thinking in the Organize Phase.

Generalize

In the Generalize Phase, students draw on facts or skills to articulate statements of conceptual understanding. Using **organizers** developed in the previous phase, students recognize patterns and make connections. Students then identify relationships between concepts and state their conclusions as generalizations. As detailed in Chapter 1, generalizations are statements of understanding, which describe the relationship between two or more concepts. For example, a generalization connecting the concepts of *voice* and *audience* may be “Writers use voice within their writing to communicate effectively to an audience.”

As generalizing leads to transferable understanding, we believe that this is the *most critical* phase of the inquiry process. Without this phase of inquiry, we cannot be sure that children will be able to apply their thinking to new situations or contexts they may encounter. The Generalize Phase provides the foundation for various types of transfer that occur during and after a unit, including student-initiated action. Chapter 8 examines ways that teachers can scaffold student thinking to develop conceptual understandings in the Generalize Phase.





Photos 2.5 and 2.6 The Generalize Phase in Action

Students in Carl Waugh's Middle School Design and Technology class generalize about the role of rendering in a final design.

SOURCE: David French



Transfer

After our students have formed generalizations, we allow time for the application and transfer of these to new factual examples within an inquiry. During the Transfer Phase, students are encouraged to “test out” their conceptual understandings, ensuring they are valid and accurate. Teachers plan learning engagements to help children assess and refine the transferability of their generalizations. We ask questions related to different types of transfer such as:

- Is this understanding *always true*, given the case studies we researched?
- How can we adjust the wording of our understanding, so it better reflects all our factual examples?
- How does this understanding relate to current events and issues in the world today?
- Can we relate our understanding to new situations and predict how it will “fit”?
- Can we apply our understanding to create new ideas, products or projects?

Although the Transfer Phase exists as part of the Concept-Based Inquiry process, it often extends beyond the time spent on a unit in a classroom. Students continue to transfer their understandings when they encounter current events and new learning that relate to an inquiry. When these situations arise, we can highlight them in discussions to reiterate how our understandings apply to the world outside the classroom. As educators, we can also choose to revisit this phase of inquiry long after a unit is complete, especially when “teachable moments” arise that help children consolidate or extend their understanding. Chapter 9 examines types of transfer and how these can be encouraged during the Transfer Phase of inquiry.



Reflect

Reflection is not a phase in itself, but embedded into all parts of our model of Concept-Based Inquiry. Using metacognitive thinking, students consider how knowledge, skills, and understandings gained in a unit may have changed one's mindset, perspective,



Photo 2.7 The Transfer Phase in Action

Jessica Humble-Crofts' students at the American School of Bombay hypothesize about ways to minimize thermal energy transfer and develop models to test their ideas in the Transfer Phase of inquiry.

SOURCE: Jessica Humble-Crofts

or behaviors. We encourage individual and class reflection on learning throughout a unit to plan for success, monitor progress, and evaluate the outcomes of an inquiry. Making reflection a regular practice in our classrooms promotes a strong sense of agency, as students are motivated and invested in the learning process. By modeling reflective talk as a class community, we create the expectation that all students *actively* use their learning. In this respect, reflection may integrate seamlessly with the Transfer Phase, especially at the end of an inquiry. Chapter 10 looks in depth at the role of reflection throughout the Concept-Based Inquiry process.

The Complexity of Inquiry

One of the inherent risks in articulating a model of Concept-Based Inquiry is that it becomes a series of rigid steps to be followed in a prescribed order. Although models can support sense-making, we recognize that authentic inquiry is messy and complex. For this reason, our model of Concept-Based Inquiry should be viewed as *recursive* rather than linear, as phases do not always follow one another in sequential order. For instance, it is common for students to synthesize their findings and form generalizations multiple times in a unit, returning to the Investigate and Organize phases each time to do so. In this regard, units of inquiry may appear to have “mini-inquiries” nested within them. Inquiry is certainly a complex process, but this model provides a common language to discuss and strengthen the conceptual understandings we seek to develop in students.