A Prior Knowledge Primer

*Before you can gauge what your students know and are able to do coming into your class, it is important to **identify prior knowledge** that is crucial to performing well in your course. As an expert, it is sometimes difficult to remember all of the knowledge and skills needed to understand a concept or perform a skill at the level required by your course. Work backwards to "unpack" your main course concepts to determine prior knowledge that is most crucial for your students.*

How to Gauge Prior Knowledge

- **Talk to colleagues** who teach prerequisite courses or ask to see a copy of their syllabus. What are the learning outcomes? What are the major assignments? With which concepts did students most struggle? Did students tend to hold any inaccurate misconceptions?

- **Assess prior knowledge** that is crucial to performing well in your course. You can ask students to define terms, solve problems, or apply knowledge to novel situations. You can score each assessment if you have a small class or assess a random sample of 20 or 30 of them to get an idea of the general level of preparedness among students.

- **Have students assess their own prior knowledge** of concepts or skills necessary your course. Students can self-assess on a sliding scale beginning with "I am not familiar with this at all," moving to "I have heard of this," to "I can define this," and finally to "I can explain this to someone else." If you tell students their honesty will help you plan the rest of the course, students will tend to be more honest than not.

- **Use brainstorming to reveal prior knowledge** and the extent of prior knowledge and misconceptions. Brainstorms can be as simple as a paragraph, list, or concept map "brain dump" or explanation of a concept with you, the instructor, as the audience. If you have a large class, collect all brainstorms but read only a sample of them to get an idea of the level of student understanding.

- **Assign a concept map activity** on a specific concept, a question, or a broader topic. Design the activity based on what you want to know to inform your teaching. Do you want general terms and ideas? Do the links between concepts need to be labeled? You can provide students with main terminology and ask them to expand on this terminology and how concepts connect to each other. Be clear about what you are looking for by providing an example.

- **Assign other graphic organizer activities** to gauge levels of prior knowledge. Find a graphic organizer that mirrors the level of understanding students are supposed to have upon entering your course: Venn Diagram (compare/contrast), Sequence Map (sequence of events or a

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process), Overlapping Circles (part to whole), Multiple Meanings (nuances of a concept). This resource includes over twenty graphic organizers that can be used to gauge prior knowledge as well as act as excellent learning tools for your students. If you have a large class, collect all graphic organizers but read only a sample to get an idea of the current level of student understanding.

- **Look for patterns of error in student work** to determine common misconceptions. Keep track of these patterns to target instruction during the semester and better prepare for future semesters.

How to Activate Prior Knowledge

- **Design activities** that activate prior knowledge. People learn best when new knowledge is linked to prior knowledge. Brainstorming, graphic organizers, and student discussions can all be used help students recall what they already know about a topic.

- **Link concepts** to material taught in previous courses.

- **Link concepts** to material taught in your own course – the previous day, week, or unit.

- **Use analogies and examples** that link to everyday, common knowledge. Be sure to use multiple analogies and examples so that students from various backgrounds can make the connection.

- **Ask students to make predictions** based on prior knowledge and explain the reason for their predictions. Students can discuss predictions with a partner or small group before revealing the "answer" or new information.

How to Address Gaps in Prior Knowledge

- **Identify prior knowledge** students are expected to have and to what extent. Do they need to know the "what" and "why?" or do they need to know "how" and "when?" You don't want to scare students from your course, but you do want students to know what they are expected to be able to do coming in.

- **Assist students** who need extra support with prior knowledge. Once you identify knowledge gaps or misconceptions, you can provide direction for students in the form of targeted tutorials posted on Canvas, on-campus tutoring, or other supplemental help. Once you collect this material, you will have it for subsequent semesters.
    - If only a few students need support with prior knowledge - provide a list of terms to know or a glossary of terms, post online tutorials targeted at very specific skills or knowledge, direct students to on-campus assistance or office hours at "just in time" moments. For example, "If you are struggling with this concept, you might need extra

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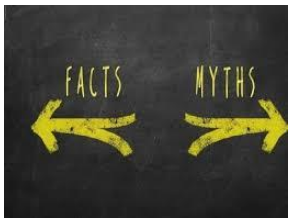
practice in _____. I suggest these resources (or office hours and name the hours). Once you brush up on _____, you will be right on track to succeed in this course.
    - If many students need assistance with prior knowledge – dedicate a class session or two to relearning and practice.
    - If all or nearly all students need assistance with prior knowledge – you might consider revising your course or collaborate with instructors of the prerequisite course to find a solution.

How to Help Students Recognize Inaccurate Prior Knowledge



- **Explicitly identify discipline-specific conventions, context, or uniqueness** of a concept that can easily be confusing based on a less-nuanced or misunderstanding. Allow students to process this information aloud with peers; then double-check their revised understanding.

- **Show where analogies** break down and might become non-examples. Ask students to engage in this thinking process as well - aloud, in writing, with sketches, etc…

- **Address common misconceptions** based on prior knowledge. To assess students' new understanding, engage them in a quick activity where students write, "I used to think _____, but now I know _____." Collect these statements to check for revised understanding.

Methods to Correct Inaccurate Knowledge

- **Ask students to make (and test) predictions** of what happens next, what something is connected to, what affect something had on something else – anything to get them thinking and talking about new concepts in relation to prior knowledge. Be a fly on the wall as students discuss. Immediately address misconceptions.

- **Ask students to justify their reasoning** with partners, in small groups, or in writing. The more you know where students' ideas are coming from, the more you can address inaccuracies.

- **Provide multiple opportunities for students to use accurate knowledge** by designing multiple checks for understanding. We know that students do not learn by listening and taking notes. Checks for understanding allow students to process information aloud and in writing, providing you with valuable information about where they are in their understanding and providing themselves with information about their own knowledge gaps.

- **Allow sufficient time and patience** for new knowledge to be revised and processed. It takes time and energy for misconceptions and inaccuracies to be relearned.

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