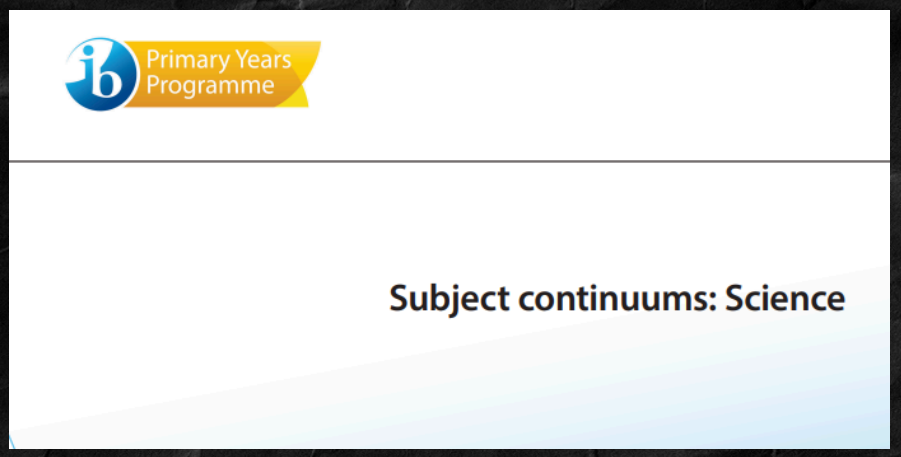

PYP Science Subject Overview 2025

&

Conceptual Learning

A breakdown for PYP educators

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The Science Learner and The Science Educator

The Science Learner Capabilities

The Science Educator Capabilites

The Science Learner	The Science Educator
engage in hands-on learning experiences to foster scientific inquiry and questioning	Provide opportunities to support students to engage in their own inquiries
express wonderings	Guide students to formulate their own questions
select and use appropriate tools to measure data accurately	Design learning experiences and assessments that are inclusive for diverse students, and provide access to a variety of external resources and settings
use scientific vocabulary to explain their observations and experiences	Model scientific language
embrace uncertainty and ambiguity	Promote learner reflection and action in response to their learning
engage in discussions, dialogue, and data interpretation	Build connections between students' experiences and the information and processes obtained from the inquiry into new understandings
propose scientific explanations to justify hypotheses	Model scientific language, Guide students to formulate their own questions
understand multiple perspectives in science, and consider applications for them	Collaborate with classroom educators and other single-subject educators, to plan and develop central ideas, incorporating their input

These aligned roles come to life in the learning outcomes

Science skills aren't just actions. Students need to explicitly understand why, and how to use them

Educator practices should directly impact and support the learner's capabilities

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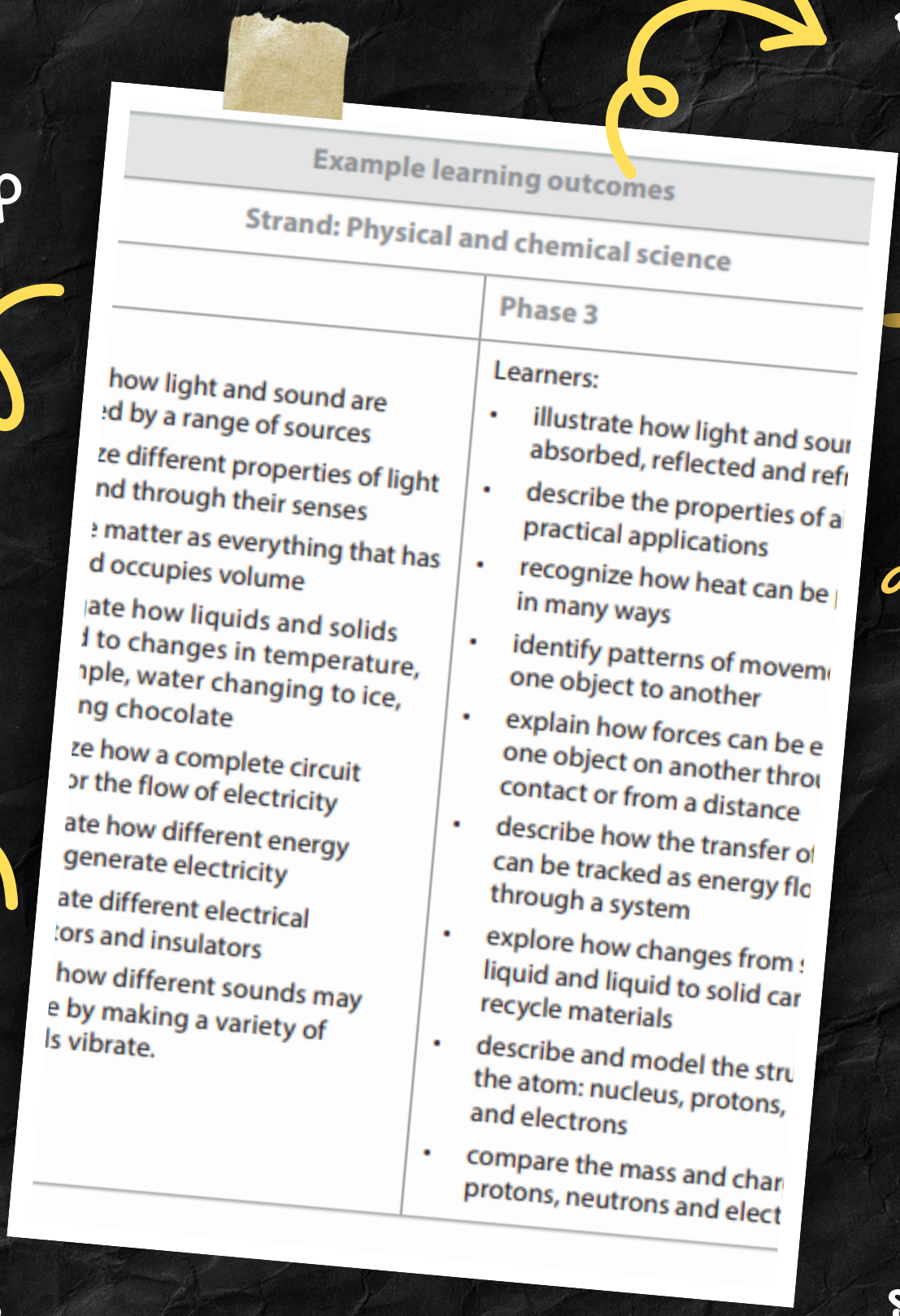
Example Learning Outcomes

Knowledge and Skills

Identify the scientific skills students should develop

Example learning outcomes



Example learning outcomes	
Strand: Physical and chemical science	
	Phase 3
how light and sound are ed by a range of sources ze different properties of light nd through their senses matter as everything that has d occupies volume ate how liquids and solids to changes in temperature, nple, water changing to ice, ng chocolate ze how a complete circuit or the flow of electricity ate how different energy generate electricity ate different electrical tors and insulators how different sounds may e by making a variety of ls vibrate.	Learners: • illustrate how light and sou absorbed, reflected and refl • describe the properties of a practical applications • recognize how heat can be in many ways • identify patterns of movem one object to another • explain how forces can be e one object on another throu contact or from a distance • describe how the transfer o can be tracked as energy flo through a system • explore how changes from liquid and liquid to solid car recycle materials • describe and model the stru the atom: nucleus, protons, and electrons • compare the mass and char protons, neutrons and elect

Once we identify knowledge and skills, we can explore how they support concepts

Skills and facts form the foundation for understanding concepts and conceptual understandings

Identify the specific topics and facts students need to learn

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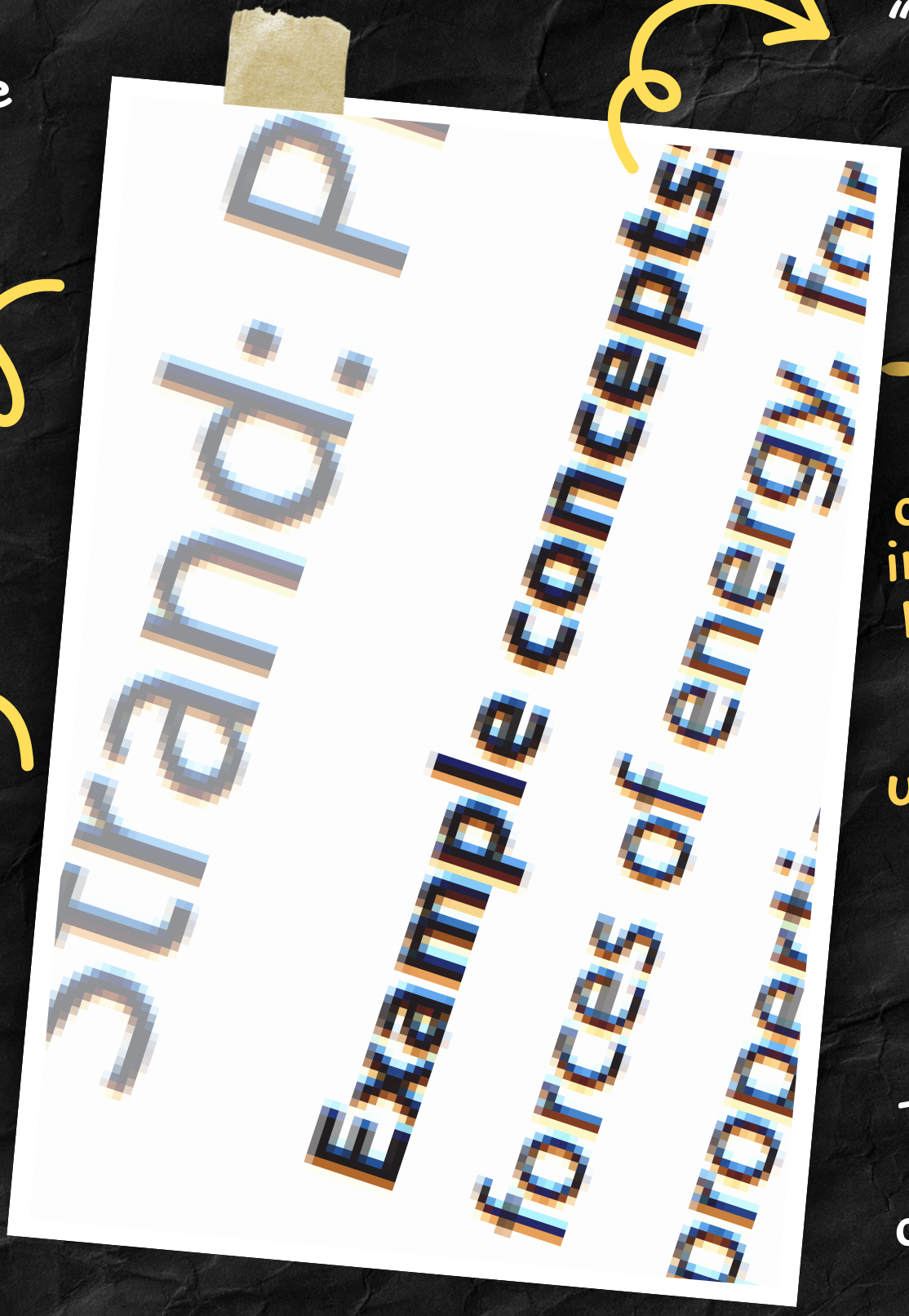
Concepts as Curriculum Organizers

Additional Concepts

Concepts act as organizers for knowledge and skills

Science-Specific "Additional" Concepts



Making concepts visible in daily practice helps students develop true conceptual understandings

Additional "related" concepts hold the same value as the specified "key" concepts

These subject-specific concepts allow students to investigate & understand science at a deeper, more meaningful level

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Conceptual Understandings

As educators, we must be intentional in teaching scientific skills explicitly

Example Conceptual understandings

Example conceptual understandings	
Strand: Physical and chemical science	
	Phase 3
naterials can have reversible changes through physical processes.	Solids, liquids and gases be different ways and have ob properties that help to class
ange in position over time.	Forces can impact on how a moves or changes shape.
ass and takes up space.	All matter is made of atoms composed of protons, neut electrons.
	There are connections betw and the behaviour of object
ake different forms (for rgy in fields, thermal energy, tion).	Energy can be transferred ir and between objects.
es of vibrations generate	Properties of light and soun their source and the object they interact.

Let's see how it all comes together in an example

Students must investigate factual examples or scenarios and explicitly connect these to concepts

For students to develop conceptual understandings, they need opportunities to explore how concepts connect

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How It All Comes Together

A Unit Example

Here's a snapshot from a unit on Materials and Matter

🧠 Students learned to ask testable questions and conduct experiments, building their scientific skills.

🔍 Students investigated the concepts of matter, properties, and temperature.

🧪 Students explored changes in states of matter by conducting experiments and reading nonfiction texts and scenarios.

🔗 Students made the connection between concepts of properties, change, and matter to articulate their understanding.

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