

What makes an IB Physics Kognity Learner?

Kognity supports students in growing as empathetic peacemakers, who are rooted in international mindedness and have a commitment to respecting humanity and the environment. Use the tree below to explore how Kognity nurtures IB Physics learners in developing these skills.

IB Learner Profile Attributes with Kognity

Figure 2. Our sketch of the beach ball in flight (no air resistance).

Example 3
A fixed amount of gas at constant volume at 18°C and 1.0 atm is heated until its pressure reaches 3.0 atm. Determine its new temperature.

Show solution

But what can affect the resistivity? The first thing to think about is the temperature of the component. You might remember the animation below from 5.2.2, showing the effect of increased temperature (and therefore the movement of the ions in the conductor) on the flow of electrons.

Theory of Knowledge

Boyle's, Charles's and Gay-Lussac's contributions to thermal physics resulted in a set of *empirical laws*: a set of mathematically-expressed interpretations of empirical (experimental data) evidence. Note that these laws do not provide any kind of underlying causal model for the relationships between pressure, volume, and temperature for an ideal gas, but merely mathematically interpret a set of verified experimental results.

To gain a causal model for these relationships, we need a *theory*. A theory, as compared to a law, is an *explanation* for an observation or series of observations that is supported by a considerable body of evidence.

When considering the difference between empirical law and theory, think about the following **Knowledge Questions**:

- In what ways do laws and theories both require supporting empirical evidence?
- Are theories hierarchically more important than laws?
- In what ways does language – especially that surrounding the use of the word theory – confuse or hide the scientific meaning of the terms?

Approaches to Teaching and Learning with Kognity

IA.1 Internal Assessment guide

Sections Completed: 8 / 0

- IA.1.0 Introduction
- IA.1.1 Getting started
- IA.1.2 Personal engagement
- IA.1.3 Exploration
- IA.1.4 Analysis
- IA.1.5 Evaluation
- IA.1.6 Communication
- IA.1.7 Checklist for final report

ACTIVITY

You can select distances and the ratio of traveller's speed to the speed of light (called beta) in an online Twin Paradox simulation. This free download is from Open Source Physics and the file is named "sr_twin.jar". Here is the Twin Paradox Program and a sample image.

Here, in this example, beta (the v/c ratio) is 0.5. The stay at home twin ages eight units of time while the travelling twin ages only 6.8 units of time.

Students are guided through the importance of academic honesty as well as how to access reliable external resources to do a deep dive into topics or gather sources for the Internal Assessment.

Research

TOK boxes embedded in the text as well as 3D models and other visual resources provide great opportunities for students to collaborate and reflect on the subject matter together.

Social

The "Nature of Science" boxes are excellent ways for students to reflect on their learning, while exam-style practice questions allow students to use critical thinking skills to apply their learning to unfamiliar situations.

Thinking

Kognity provides many different ways for students to build communication skills through the digital platform, focusing on streamlined feedback, intercultural communication and peer interaction.

Communication

Nature of Science

Although mathematically impressive in its modelling and predictive capabilities, nobody could penetrate the core of the concept of energy. Read section 4-1 of Feynman Lectures on Physics by Richard Feynman at this link, where he discusses the abstract nature of energy.

Self-Management: Organization

Students can develop time management and organization skills by keeping track of their progress and mastery of different topics through their strength bar, and keep up to date with assignments on their homepage.

2.4 Momentum and impulse

Sections Completed: 4 / 3

Strength: [Progress bar]

- 2.4.0 The big picture
- 2.4.1 Defining momentum and impulse
- 2.4.2 Momentum conservation
- 2.4.3 Checklist

Take Strength test Previous subtopic Next subtopic

Strength battle

Battle an opponent, or view your current and past battles.

Create new battle

1. Pick an opponent

- Battle the Kogbot
- Battle a classmate
- Choose a classmate --
- Kyla Alvarez
- Johan Bernadotte
- James Denkin
- Melissa Gilbert
- Marcus James
- Lester Nygaard
- Ruchi Patil
- Isobel Reyes
- Nicholas Straus

Start battle