

PH105 General Physics I

Patrick LeClair

Contact

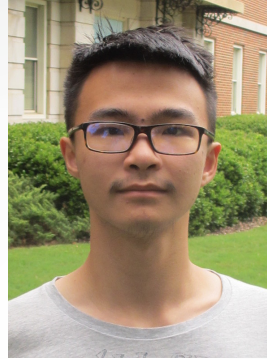
- pleclair@ua.edu
 - Put “PH105” in subject
- office
 - 208 Gallalee (enter through 206)
- office hours
 - MWF 1-2pm
 - email for other times
- ODS accommodations? Let me know ASAP.

Graduate Assistants

- Andrew Buccilli



- Modi Ke



- They will run the labs
- you'll meet them next week & get contact info
 - no lab today
- grads have pooled office hours (“help desk”)
 - will post schedule when this starts

Lectures

- *principles* - new material covered in lecture
 - mostly discussion and concepts
 - worry about logic, strategies ... *why*
 - read chapter ahead of time ...
- *practice* – not something you can watch
 - have to *do* it!
 - read this one on your own and practice
 - will devote some time in class to group problem solving, particularly on Fridays
- Slides (when we use them)

Experiments

- Not just experiments - this is *practice* time
 - start of each period will be example problems, Q&A
- <http://pages.physics.ua.edu/lab10x/>
- followed by lab introduction
- read the lab ahead of time
 - if you don't, read it before you start
- More than just baking a cake.
- drop 1 lab at the end of the semester
- I set the schedule, but TAs run the labs

Topics

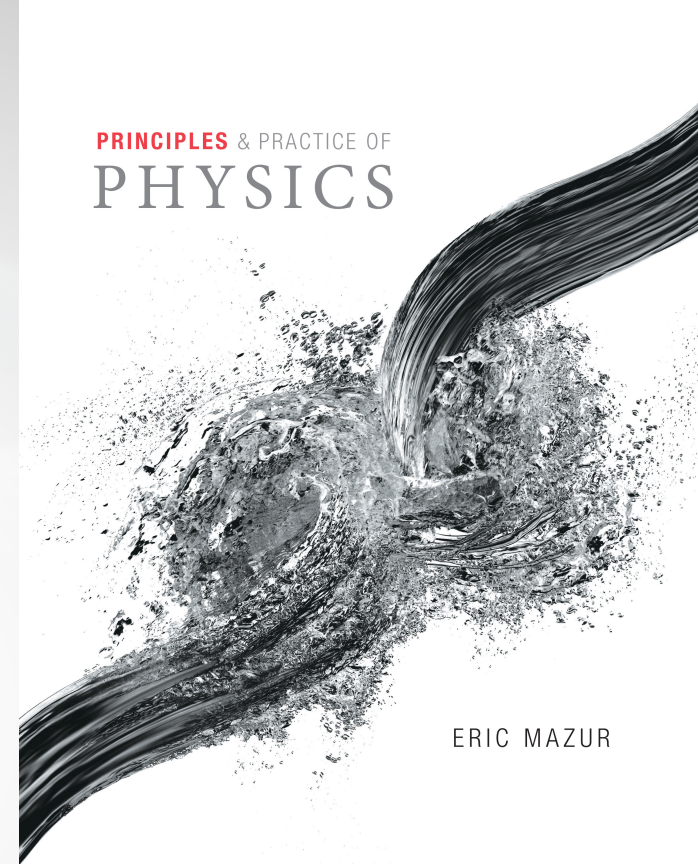
- Motion in 1D
- Acceleration
- Momentum
- Energy
- Interactions [energy]
- Force
- Work
- Motion in 2D
- Rotation & torque
- Gravity
- Periodic motion
- Waves
- Fluids
- Entropy
- Thermal energy

Syllabus

		Primary topic	Mazur Reading	in lab	Note
10-Jan		syllabus, overview			
12-Jan		1D motion	2.1-5		
15-Jan		MLK Jr Day			
17-Jan		1D motion	2.6-9	error analysis	last day to add or drop without W
19-Jan		1D motion			
22-Jan		acceleration	3.1-5		
24-Jan		acceleration	3.6-8	1D motion	
26-Jan		acceleration	3.all		
29-Jan		momentum	4.1-5		
31-Jan		momentum	4.6-8	Newton's law	
2-Feb		momentum	4.all		
5-Feb		EXAM 1	Ch. 2-4		
7-Feb		energy	5.1-4	Friction	
9-Feb		energy	5.5-8		
12-Feb		energy	5.all		
14-Feb		interactions	7.1-6	Friction or TBD	
16-Feb		interactions	7.7-10		
19-Feb		interactions	7.all		
21-Feb		force	8.1-6	work-KE	
23-Feb		force	8.7-12		
26-Feb		EXAM 2	Ch. 5, 7-8		
28-Feb		work	9.1-5	momentum	
2-Mar		work	9.6-8		midterm grades due at midnight
5-Mar		work	9.all		
7-Mar		motion in a plane	10.1-4	rotational dynamics	
9-Mar		motion in a plane	10.5-8		
12-Mar		SPRING BREAK			
14-Mar		SPRING BREAK			
16-Mar		SPRING BREAK			
19-Mar		motion in a plane	10.all		
21-Mar		motion in a circle	11.1-4	TBD	
23-Mar		motion in a circle	11.4-6		
26-Mar		torque	12.1-5		
28-Mar		torque	12.6-8	Archimede's law	last day to drop with W
30-Mar		torque	12.6-8		
2-Apr		gravity	13.all		
4-Apr		gravity	13.all	Simple Harmonic Motion	
6-Apr		honor's day			
9-Apr		preiodic motion	15.1-7		
11-Apr		Exam 3	Ch. 9-13	Standing Waves	
13-Apr		periodic motion	15.all		
16-Apr		Waves in 1D	16.1-6		
18-Apr		Waves in 2D, 3D	Ch. 17 selected	Boyle's law	
20-Apr		fluids	18.1-5		
23-Apr		fluids	18.6-8		DEAD WEEK
25-Apr		entropy	19.1-8	Calorimetry	DEAD WEEK
27-Apr		thermal energy	20.all		DEAD WEEK
1-May	Tue!	FINAL EXAM 11:30am-2:00	cumulative		

Textbook

- Principles & Practice
 - separated for a reason
 - get concepts first
- more sensible ordering of topics
 - based on education research
 - ‘builds’ better
- can get ebook with homework system
 - (cheapest overall I *think*)
- Used books are fine (but Amazon will be backlogged)



Grading

- Exams 45%
 - 3 in class, multiple choice, 10% each
 - 1 final, multiple choice, comprehensive, 15%
- Homework 15% (weekly)
- Labs 15%
- Quizzes 15% (online, before each lecture)
- Participation 10% (online)

Participation?

- I don't grade attendance. You have to do something.
- Labs are one part of this.
- The other part – online discussion/QA system



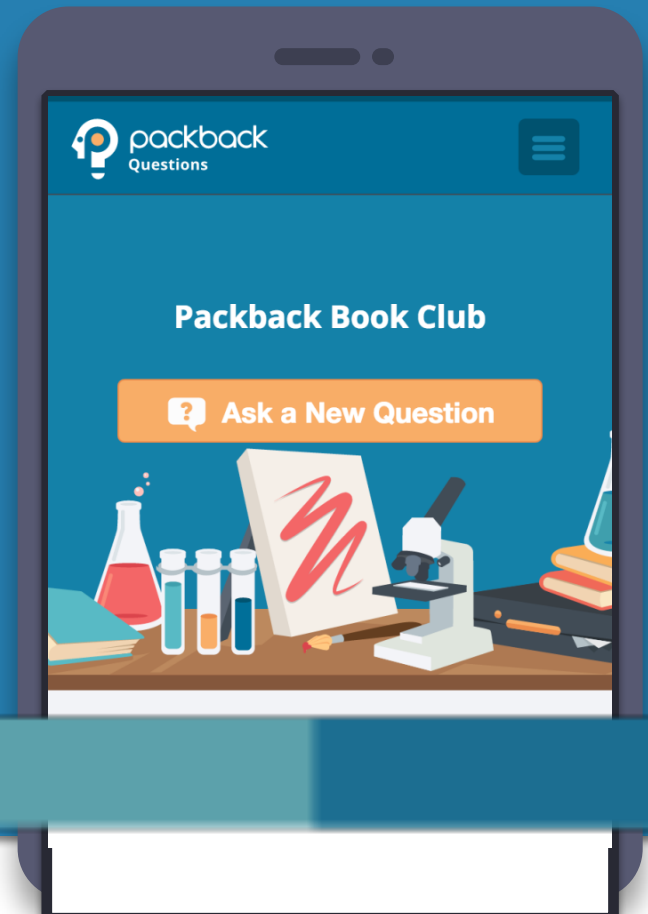
packback

Fearlessly curious.



Our class is using Packback Questions for curious, out-of-class discussion.

- Earn participation points for being curious
- Read the most interesting answers from your classmates
- Ask questions about the topics that interest you most
- Learn how the things you're learning in class apply to your future



What to post in Packback Questions



Open-ended questions that have more than one right answer

- Try question starters like “How could”, “Why”, and “What might happen”
- Ask for **examples and ideas**, instead of answers and **definitions**



Questions asking for extra help that show your work

- Show your work or progress up to where you got stuck
- Provide details to explain **exactly** what you need help with!



Share a resource, article or idea that inspired you and ask for responses

- Share the resource (video, article, link) that inspired your curiosity



What **not** to post in Packback Questions

X

No questions about the tests, homework, or class logistics

• *For example: “Is class cancelled today?” or “What’s the answer to #4?”*

X

No duplicate questions or answers

X

No profanity or inflammatory language; be kind and mindful

X

No cheating (this is not a place to get answers to homework)

X

No Closed-Ended Questions (Questions with only one right answer)

X

No plagiarism, or posts that are primarily quotes from other sources



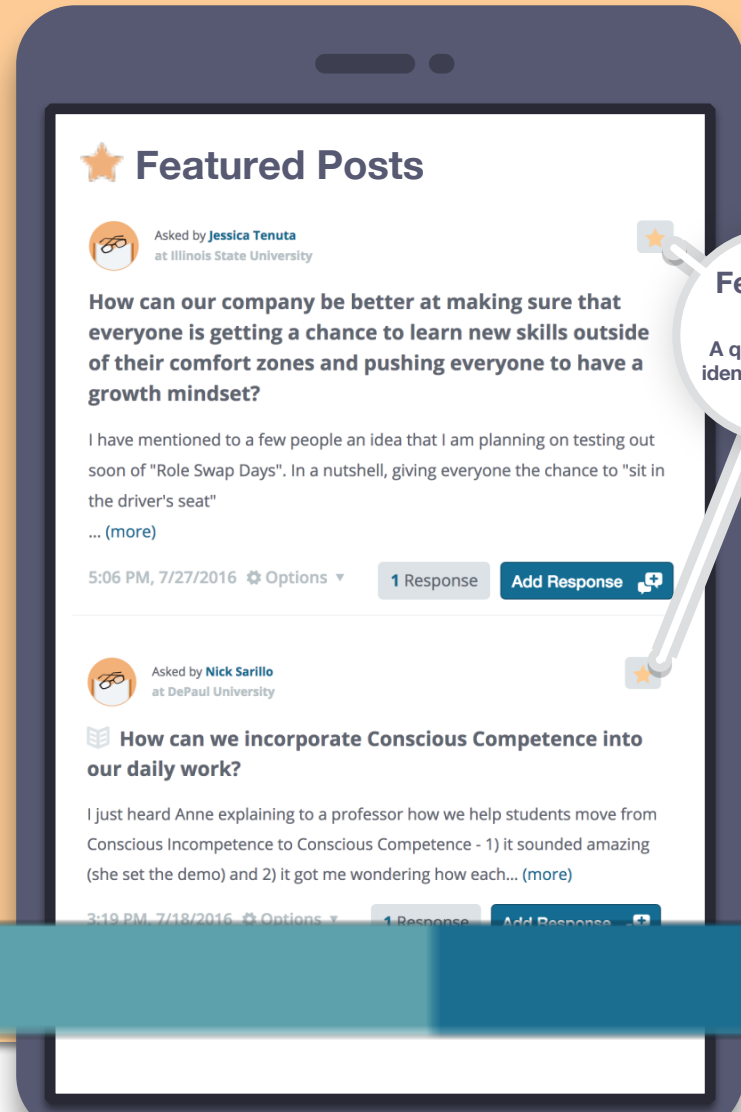
The Featured Tab

The Featured Tab keeps all the best posts in your community just one click away.

How do posts get featured?

The Community Health Algorithm suggests great posts to our moderators.

Packback Moderators or your professor hand-feature the “can’t miss” posts each week for you to read.



Featured Label
A quick way to identify featured posts

“Flagged” Posts

If your post is “Flagged”, it was flagged by a community member OR detected by our algorithm for potentially violating a Community Guideline.

Will all “Flagged” posts be deleted?

No! Flagged posts are reviewed by our Moderators. Just because a post is flagged does not mean it will be deleted.

Very short answers will always be removed.

This question is flagged. If you add a response on this thread, it may be deleted.

Moderation Queue

Text	Reporter	Reason
Deckop combined Reich: if capitalism starts to use universalism as decision-making model , will it conflict with profit maximization?	System	Too Class-Specific
Friedman combined with Wicks: Will local living economy free companies from their corporate responsibility?	System	Too Class-Specific
fat to replace bone marrow?	John S.	Not a Question
What is the relationship between Non-communicable diseases and aging?	System	Closed-Ended
What is the main threat to the health of young adults?	System	Closed-Ended
What is the definition of diaspora?	System	Closed-Ended
What the is the answer to #2?	System	Too Class-Specific
When did the civil war end?	System	Closed-Ended

Reporter
Flagged by AI

“Flag” Reason
Algorithm Criteria Triggered

Moderator Actions
 Edit
 Dismiss
 Delete

The Learner Leaderboard

See how your **Curiosity Score** stacks up to your classmates in the Learner Leaderboard

How the Curiosity Score is calculated

Depth: How detailed your post is

Presentation: How much effort was used

Credibility: Did your post cite sources?

Behaviors: How did you participate?

Your professor may grade based on Curiosity Scores.



How to get started on Packback

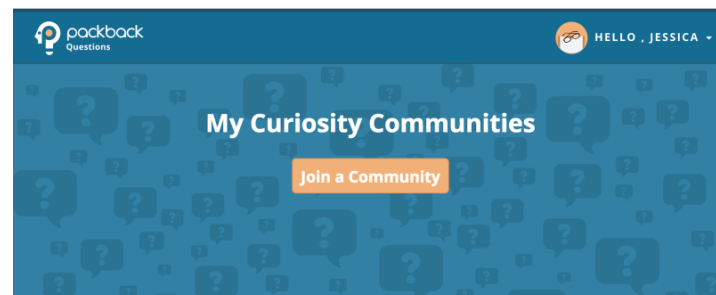
1. Check your inbox for an email from Packback

2. Finish creating your account (if you received an email) OR create a new account

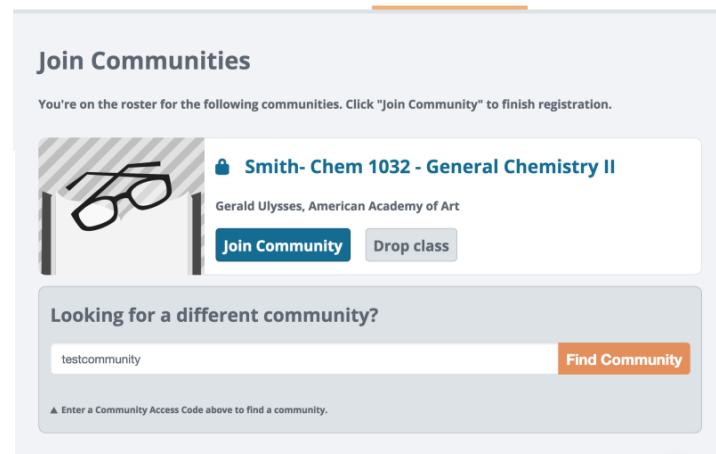
- If you were on your professor's roster, that means we will have created an account for you. You just need to set your password.

3. Log in & navigate to the "Join a Community" tab

- If you see your class, click the "Join Community" button on the community to finish registration.
- If you do NOT see your class, enter the access code from the syllabus into "Find Community" module.



View Communities **Join a Community**



Didn't get an email?

Go to packback.co

Access code:

5B8DB898-343B-1C82-1CEC-F77765F623F9

take a picture (also in syllabus)

[our community](#)

Have any questions?

Click “**Contact Us**” or **chat with us!** Our average response time is 2 hours.

What should I ask Packback?

- **Why didn't my payment process?**
- **What is my Curiosity Score?**
- **Why is my question flagged?**
- Anything Packback related...

What should I ask my professor?

- **When is the next test?**
- **How should I study for the final?**
- **My dog ate my homework?**
- Anything else NOT Packback related...



Zahrea S.

Anyone know any reliable videos with visuals examples for practice with velocity with physics?

Additional help

[Packback Archive](#) > [Fall 2015 Archive](#) > [\[FALL 2015\] Principles & Practice of Physics \(LeClair\)](#)

Aug 27, 2015 - 09:09 PM

[Comments \(0\)](#) | [New Comment](#)

Do you have the same question? [Follow this Question](#)

ANSWER THIS QUESTION

[Report it](#)

Answers



AI W.

Aug 28, 2015 - 08:12 AM

Khanacademy.org is great for stuff like that! I use it all the time for math stuff too so it's a very well-rounded site if you need help with multiple subjects. <- Is that a video for what you wanted?

[Comments \(0\)](#) | [New Comment](#)

0 | 0 | [Report it](#)



Emily P.

Aug 28, 2015 - 06:14 PM

I like using clutchprep.com for videos. I used that website for organic, and it helps for physics too.

[Comments \(0\)](#) | [New Comment](#)

0 | 0 | [Report it](#)

Are the cracks in the roads caused by the friction between the asphalt and the tires?

10:25 PM, 6/19/2016 ⚙ Options ▾

 Add your own Response



Answered by **Husam Ali**
at The University of Alabama

Cracks in the road are not caused by the friction between asphalt and the tires. Instead the cracks are caused by the expansion and contracting of the concrete. This is primarily caused by the suns heating and then the concrete cooling off during the night.

10:36 PM, 6/19/2016 ⚙ Options ▾



Answered by **Charles Williams**
at The University of Alabama

Water seeps into tiny spaces found on the road, freezes and expands making the cracks bigger. This happens repeatedly and eventually the road is filled with pot holes.

8:01 PM, 6/20/2016 ⚙ Options ▾



Participation

- it is like StackExchange or Reddit
- you ask & answer questions
up/down vote both Q & A
- **expect 3 Q+A per week** starting next week
don't do them all on Friday
if you treat it as a chore, it will be
- Participation = 10% of your grade
- start next week. sign up now. ~\$18 to join

Homework

- <http://MasteringPhysics.com>
- course code: PLECLAIRS18
- ***Register using your crimson email (why?)***
- need an access code too
 - should have received one with a new book
 - can buy one separately from site above
 - can get ebook + MasteringPhysics
- new homework “every” week
 - due Friday at 5pm, **5% late per hour**
 - penalty for multiple tries, bonus for unused hints
- drop lowest single set

Quizzes

- Short reading quiz before every lecture (<10m)
 - on MasteringPhysics.com
- opens a day or two before, closes at class time
 - none on exam days
 - **first one next week Wed!**
 - no credit if late!
 - 2 attempts per question (with penalty)
- a few multiple choice questions
 - *mostly* qualitative, on that day's reading
 - read the chapter, you're OK!
- may be quizzes in lab too

Example:

Prelecture Concept Question 2.01

Part A

In the study of physics, what distinguishes a scalar from a vector?

- A scalar is specified with a single number, but a vector is specified using both a magnitude and a direction.
- Nothing—the terms “vector” and “scalar” are different names for the same thing.
- A scalar must always be positive, but vectors can be positive, negative, or zero.
- Scalars have both a magnitude and a direction, but vectors have only a magnitude.
- A scalar is a dimensionless number, while vectors are numbers that have dimensions.

Submit

My Answers [Give Up](#)

Example:

Prelecture Concept Question 2.01

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Submit

[My Answers](#) Give Up

Correct

Misc

- No formal attendance policy
 - exams may rely on things I say in class
 - quizzes during lecture are possible
 - will post slides for each lecture (if used)
- Missing in-class work/exams
 - let me know ahead of time
 - if that's not possible, ASAP after
 - acceptable reason = makeup or bye
- Will keep grades on MasteringPhysics
 - will try to avoid Blackboard

For today

- a bit of Ch. 1 – Foundations
- should be largely review, or at least sensible
- just to ‘set the stage’

For Friday

- try to secure a textbook.
 - flip through Ch. 1 (should be review)
 - read the first half of Ch. 2
- we'll start discussing 1D motion
- a bit more info on labs

For Wednesday next week

- **No class on Monday** (MLK Jr Day)
- make sure you sign up for Mastering Physics
 - first reading quiz is due Wed by class time
- make sure you sign up for PackBack Answers
 - first 3 Q & A due by the end of next week
- begin reading Ch. 2 of Mazur
 - 2.1-2.5 before Wed class

Chapter 1 Foundations

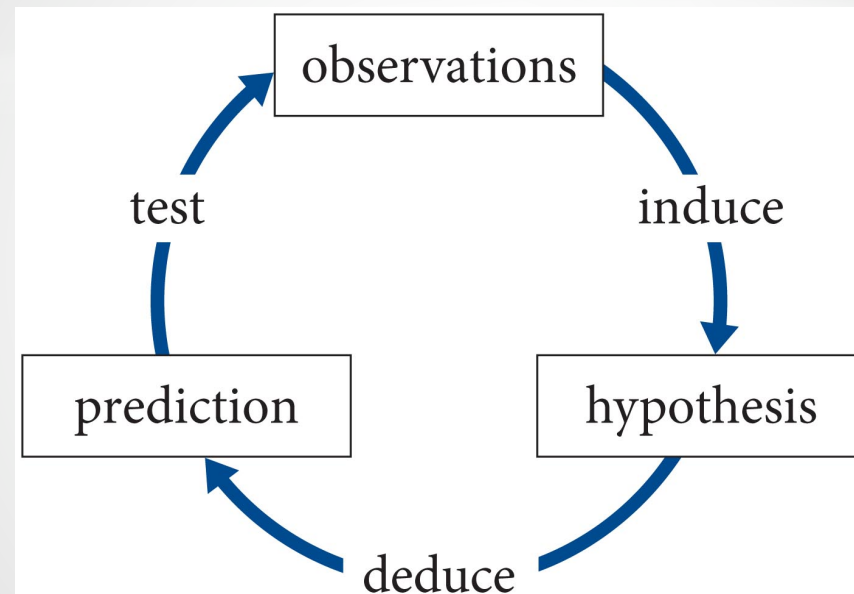
Concepts

Section 1.1: The scientific method

- Physics is about discovering the unifying patterns that underlie all physical phenomena
 - Ranging from the scale of subatomic particles to the DNA molecules and cells, and to the scale of stars and galaxies.
- The goal is to find the most fundamental laws that govern the universe and to formulate these laws in the most simple and precise way possible.
 - Some things are simpler than others

Section 1.1: The scientific method

- **The Scientific Method** is an iterative process by which scientists endeavor to construct these laws of nature.



- If the prediction is inaccurate you modify the hypothesis
- If the predictions prove to be accurate test after test it is elevated to the status of a **law** or a **theory**.

Section 1.1: The scientific method

Exercise 1.1 Hypothesis or not

Which of the following statements are hypotheses?

- (a) Heavier objects fall to Earth faster than lighter ones.
- (b) The planet Mars is inhabited by invisible beings that are able to elude any type of observation.
- (c) Distant planets harbor forms of life.
- (d) Handling toads causes warts.

Section 1.1: The scientific method

Exercise 1.1 Hypothesis or not

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- ~~(b) The planet Mars is inhabited by invisible beings that are able to elude any type of observation.~~
- (c) Distant planets harbor forms of life.
- (d) Handling toads causes warts.

Section 1.1: The scientific method

Exercise 1.1 Hypothesis or not (cont.)

SOLUTION (*a*), (*c*), and (*d*).

A hypothesis must be experimentally verifiable.

- a) I can verify this statement by dropping a heavy object and a lighter one at the same instant and observing which one hits the ground first.
- b) This statement asserts that the beings on Mars cannot be observed, which precludes any experimental verification and means this statement is not a valid hypothesis.

Section 1.1: The scientific method

Exercise 1.1 Hypothesis or not (cont.)

SOLUTION

- c) Although we humans currently have no means of exploring or closely observing distant planets, the statement is in principle testable.
- d) Even though we know this statement is false, it *is* verifiable and therefore is a hypothesis.

Section 1.1: The scientific method

Exercise 1.2 Dead music player

A battery-operated music player fails to play when it is turned on.

- Develop a hypothesis explaining why it fails to play.
- Make a prediction that permits you to test your hypothesis.
- Describe two possible outcomes of the test and what you conclude from the outcomes.

Section 1.1: The scientific method

Exercise 1.2 Dead music player (cont.)

SOLUTION (one example):

Hypothesis: The batteries are dead.

Prediction: If I replace the batteries with new ones, the player should work.

Possible outcomes: (1) The player works once the new batteries are installed, which means the hypothesis is supported; (2) the player doesn't work after the new batteries are installed, which means the hypothesis is not supported and must be either modified or discarded.

Checkpoint 1.2



1.2 In the music player example, each outcome had a hidden assumption.

Hypothesis: The batteries are dead.

- (1) The player works once the new batteries are installed, which means the hypothesis is supported;
- (2) The player doesn't work after the new batteries are installed, which means the hypothesis is not supported and must be either modified or discarded.

Checkpoint 1.2

 “supported” isn’t the same as “proven correct”

“unsupported” isn’t the same as “proven incorrect”

That the player works with new batteries doesn’t mean the old ones were dead *necessarily*.

- perhaps the old ones were in backwards?
- perhaps changing the batteries fixed a loose contact?

That the player doesn’t work with new batteries doesn’t mean the player is broken *necessarily*.

- batteries could be in backwards both times
- new batteries might be dead too



End.