



Reflections

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Publisher of *Introductory Physical Science (IPS)* and *Force, Motion, and Energy (FM&E)*
Thoughtful Curricula Developing Thinking Students

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Frequently Asked Questions about Introductory Physical Science (IPS)

Uri Haber-Schaim

1. Why, in the 21st century, are atoms introduced in Chapter 8 and not in Chapter 1?

Surely, we could have easily started the book with a statement such as “All matter is made of atoms.” But this would have been plain dogma and not science. Students would have to accept the statement on the authority of the text and be ready to repeat it on test day. There is nothing in the experience of the incoming IPS students to justify this statement. By having the students first learn the basic properties of matter, we illuminate the way to the atomic model. In science the “how do we know” is an integral part of the “what do we know.”

2. Why is there no glossary at the end of the book?

The *IPS* textbook has an extensive index. Looking up a term in the index will invariably reveal that the definition of the term appears after its usefulness has been established. For example, the first two sections in Chapter 6 are titled “Decomposing Pure Substances” and “Experiment: The Decomposition of Water.” The definition of a *compound* appears in the last paragraph of the second section. When readers look up the reference to *compound* in the index, they will find the definition in the context in which it was developed, and not as a “stand-alone” as in a glossary.

3. Why are histograms used extensively throughout the course?

In *IPS* all the students in the class pool their experimental data to reach conclusions. Histograms of these data are the most effective way to summarize the results and show their un-

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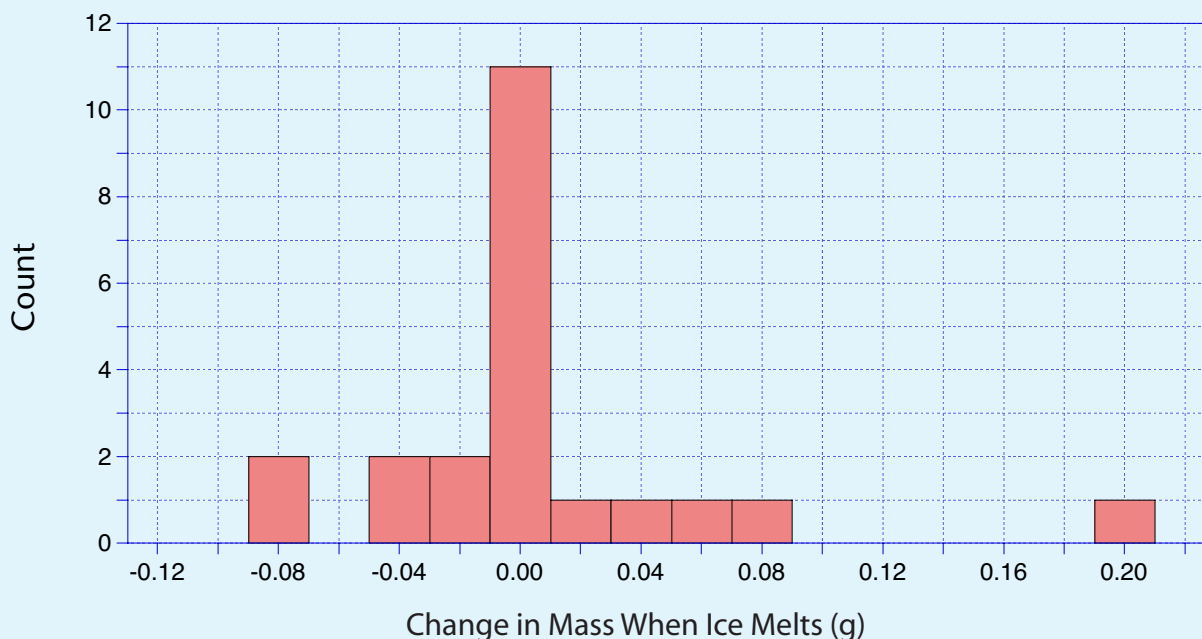
Looking for courses to take next summer?

Science Curriculum Inc. will offer three 2-semester hour courses—*IPS* Parts 1, 2, and 3—at Colorado School of Mines (Golden, Colorado) in July. For more information, [click here](#), or scan the code at the right.



FAQs (from page 1)

certainties. To illustrate the power of histograms let us look at sample data taken from Experiment 2.4: The Mass of Ice and Water.



A concentration of data within ± 0.01 g of zero is clearly visible. So are the outliers, which may warrant special attention. Drawing such conclusions from a table of data is much harder. If a teacher collects data from several classes, drawing conclusions from a table becomes unwieldy, whereas a histogram becomes even more convincing. For details on how to construct histograms on a computer, see the Ninth Edition *IPS Teacher's Guide and Resource Book*, pages xxvi and 32–34.

4. Why don't we require students to make an hypothesis before they start an experiment?

A number of educators have the notion that scientists always make an hypothesis before starting an experiment. And since they want their students to behave like scientists, they require their students to make an hypothesis before every experiment. This notion is utterly false, at least as far as physicists and chemists are concerned. Most experiments are done to find out, in an unbiased way, how nature behaves. Once enough information has been collected, physicists and chemists will venture into making generalizations and predictions, and proceed to test these predictions experimentally. The number of hypotheses in the history of science is remarkably small. One example, Avogadro's hypothesis, is discussed in detail in Section 9.6 in the Ninth Edition of *IPS*. Requiring beginning students to make a hypothesis before every experiment and make them think that they proved or disproved the hypothesis is grossly misleading. Students will think that they are acting like scientists when the opposite is true. For more on this subject see the "In Greater Depth" article on page 2 of

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Update Requests are Going Out...

We are currently in the process of updating the information we have about textbook review cycles in schools. As a result, if you haven't already received one of our "Update Request" emails, chances are good that you will receive one this Spring. The email can be identified by its subject line, "**Update Request**" and by the fact that it will come from the mailbox "**rstair@sci-ips.com**."

Please watch for this email—whether it be in your Inbox or your Junk mailbox (!)—and respond as quickly as possible.

FAQs (from page 2)

the *Teacher's Guide and Resource Book*.

5. Why have we added five chapters in the Ninth Edition of *IPS*?

Chapters 12 through 16 were added to provide options. For example, teachers who would like to keep the course on the macroscopic level and leave atoms for a later course may choose to leave out Chapters 7 through 11 and teach the last five chapters instead. They will still find a clear storyline, even if they do not reach the end of the book. Racing through all 16 chapters during a regular school year is not advised.

6. Why is our approach to energy different from that used in other textbooks?

IPS students who complete the first six chapters have plenty of experience with heating and cooling as a tool but not as the subject of study. Our approach to the study of energy builds on this experience. We place thermal energy at the base of the study of other forms of energy, and use it for measuring energy changes. This approach eliminates the need for going through a lot of Newtonian mechanics before arriving at the concept of energy, as is done in other physical science textbooks.

2014 Summer Workshops

Join us for the 2014 Introductory Physical Science Summer Workshops at Colorado School of Mines in Golden, Colorado. Earn college credit as you enhance your teaching skills in a beautiful setting at the base of the Rocky Mountains.

Properties of Matter – July 13-18, 2014

Atoms and Molecules – July 20-25, 2014

Energy and Forces – July 20-25, 2014

A workshop application is provided at the end of this newsletter.

Educating Students, Supporting Teachers, Exceeding Standards

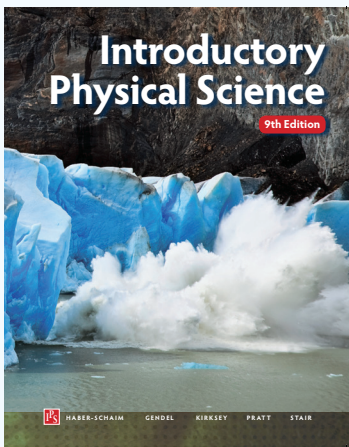
Helping students learn by:

- integrating scientific practices with science concepts and content;
- developing collaborative and analytic skills;
- scaffolding science reading skills with Comprehension Guide Questions (CGQs).

For more information about *IPS*,
scan this code



or visit sci-ips.com/links.htm



Also available as an ebook!

Science Curriculum Inc.

888-501-0957

Thoughtful Curricula
Developing Thinking Students

Supporting teachers through:

- professional development workshops;
- workshop tuition credits;
- the *IPS Teacher's Guide and Resource Book*;
- the *IPS Assessment Package*;
- videos and software.

For *IPS* ebook information,
scan this code or visit
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For information about our
physical science workshops
at Colorado School of Mines,
scan this code or visit
sci-ips.com/e_workshops.htm



To register, print and complete this registration form.
Mail it with your deposit check to the address given at the bottom of the second page of the form.

Registration for the Science Curriculum Inc.

Introductory Physical Science (IPS) National Workshops

Colorado School of Mines

July, 2014

Course selection - please check the appropriate workshop(s):

IPS Part 1 – Properties of Matter **July 13–18, 2014**

IPS Part 2 – Atoms and Molecules **July 20–25, 2014**

IPS Part 3 – Energy and Forces **July 20–25 2014**

Tuition cost: The tuition cost is \$300 for each one-week workshop.

For maximum benefit, it is highly recommended that the IPS Part 1 workshop be taken prior to the Part 2 and/or Part 3 workshop.

NOTE: Since IPS Parts 2 and 3 meet concurrently, it is not possible to enroll in both.

NAME _____

GENDER (*for lodging purposes only-please circle one*) M F E-MAIL _____

HOME ADDRESS _____

HOME PHONE _____

SCHOOL NAME _____ PHONE _____

SCHOOL ADDRESS _____

SCHOOL DISTRICT NAME _____

In what area of science teaching do you teach the most classes? (please check one)

Physical Science General Science Earth Science Other (please specify) _____

What was your major in college? _____ Graduate concentration, if any _____

Have you attended a previous *IPS* or *Force, Motion, & Energy (FM&E)* workshop or summer program? Yes No

Have you previously taught *IPS* or *FM&E*? Yes No

If yes, which program and for how many years? _____ At what grade level(s)? _____

Credit: Credit is awarded by Colorado School of Mines as graduate-level semester hours in continuing education. Each one-week workshop can be taken for 2 semester hours credit.

I do do not plan to take the workshop for credit.

NOTE: The tuition amount is the same with or without credit, and all registrants are expected to complete and submit all assignments.

LODGING AND MEALS (*Please complete this section even if you will not be staying on campus.*)

Lodging preference: (*All accommodations are single bedroom in 2-4 bedroom suites.*)*

- I will be staying off-campus and will not need on-campus accommodations.
- One week: \$246.50 (6 nights: check-in Sunday; check out Saturday)
- Two weeks: \$534.00 (13 nights (includes weekend between workshops): check-in Sunday; check out Saturday)

Meals:* (*It is recommended that participants have lunch together to facilitate the informal exchange of ideas.*)

Commuters – please complete the lunch line even if arranging for your own lunch.

- | | | | |
|-----------------------------------|--|--|--|
| Breakfast (Monday-Friday) | <input type="checkbox"/> One week (\$43) | <input type="checkbox"/> Two weeks (\$86) | <input type="checkbox"/> I will arrange for my own breakfast |
| Lunch (Monday-Friday) | <input type="checkbox"/> One week (\$53) | <input type="checkbox"/> Two weeks (\$106) | <input type="checkbox"/> I will arrange for my own lunch |
| Dinner (Monday- Thursday) | <input type="checkbox"/> One week (\$45) | <input type="checkbox"/> Two weeks (\$90) | <input type="checkbox"/> I will arrange for my own dinner. |

* The prices quoted for lodging and meals are approximate. Colorado School of Mines will set prices in early 2014.

** Please be aware that workshop participants who bring their own lunch are not admitted to the dining hall.

PARKING

Like many universities, Colorado School of Mines now charges \$4 per day for parking anywhere on campus, including streets. Whether you will be commuting or staying on campus, if you bring a vehicle with you, you will need a parking permit. Please select one of the following:

- I will not have a vehicle on campus and will not need a parking permit.
- I'll be commuting or staying on campus and will need a parking permit for one Monday–Friday workshop (\$20).
- I'll be commuting and will need a parking permit for two Monday–Friday workshops (\$40).
- I will be staying on campus for two weeks. I need a parking permit for two weeks, including the intervening weekend (\$48).

DEPOSIT AND FINAL PAYMENT

A non-refundable deposit of \$100 (payable to Science Curriculum Inc.) must accompany this application.

Please mail both to:

**Coordinator of School Services
Science Curriculum Inc.
200 Union Blvd, Suite G-18
Lakewood, CO 80228**

A confirmation of your registration and deposit will be sent to you, along with an invoice for the remaining balance.

Due to planning and commitment deadlines at Colorado School of Mines, *all outstanding balances will be due and must be paid in full by May 30, 2014.*

Signature _____ **Date** _____

If you have any questions, please contact us at 303-988-5041 (toll-free 888-501-0957) or email workshops@sci-ips.com .