

COMPILATION: Minds-on Physics textbooks are modeling-friendly

Date: Fri, 20 Dec 2002
From: Diehl <diehl5@BELLSOUTH.NET>

I am in the process of evaluating texts to be used starting next year. We have an 11/12th grade physics course. For the last 5 years I have been using Holt Physics. For many reasons I am not happy with the book.

This summer I am starting formal training in Modeling. It would seem to be a good time to change the textbook. I am not sure where to turn however. Recently I have become familiar with the "*Minds-on Physics*" books. They are research based high school physics books from Kendall-Hunt. Please let me know if you are using them. I would be very interested in your input. If you don't like the curriculum, I would also be interested in your criticism. Are there any other books you would advise?

Ideally I would not even want to use a book. It would be much better to have CASTLE, Modeling, and other handouts. The school, parents, and students will not accept that, however. We are already using the Hewitt text in 9th grade.

Date: Thu, 26 Dec 2002
From: Dave Bonar <dbonar@ALUMNI.RICE.EDU>

I am a first year modeler teaching 11th/12th grade physics. Due to system demands I must issue a physics book (Holt - the county wide book) but I do not use it. Instead I'm going bookless with the Modeling materials. I do give out chapter references to the book at times. So far I haven't heard a single complaint from parents or students.

Date: Thu, 2 Jan 2003
From: Jane Jackson <jane.jackson@ASU.EDU>

On Dec. 20, Patrick Deahl inquired about the research-informed textbooks, MINDS-ON PHYSICS (MOP). Below are pertinent e-mails by 3 modelers, posted to the modeling listserv.

Date: Thu, 01 Mar 2001
From: Trina Cannon <tcannon7@EARTHLINK.NET>

>Sherry Brown (Phase 3 from Seattle) said about MINDS-ON PHYSICS:
>I think the UMass is spot on with these materials. I have the first
>four volumes of *this excellent series which is Modeling friendly*.
>Are others of you familiar with *MINDS-ON PHYSICS*? How do you see it, in
>relation to Modeling Instruction?

I agree with Sherry. I have reviewed these materials from Kendall Hunt and I think that they are very "Modeling Friendly".

Date: Wed, 07 Mar 2001
From: Kathleen Andre Harper

I've been in correspondence with Jose Mestre and Bill Leonard recently at UMASS, and they sent me the following current information on the MOP project.

Here's an update on and a clarification of the *Minds-On Physics* project.

Late last year, Kendall/Hunt published the 6th and final volume of activities. It is the third "supplemental" volume, and includes activities on Fluids (both static and moving), Heat & Temperature, Entropy, Waves, and Oscillations. Its Teacher's Guide is due out later this year.

Although the MOP curriculum is complete, it is designed to be flexible enough to accommodate many different teachers and instructional styles. The intent is that teachers use the first three volumes as the "core", then choose activities from the three "supplemental" volumes to complete the year. Or, as many teachers have their own favorite activities or are required to do science fair projects, they can do them in the fourth quarter of the year, with a solid foundation of concepts, connections, and skills provided by the MOP core materials.

There are no formal labs and very little data gathering in MOP, though there are many hands-on activities. The main reason for this apparent omission is that there are lots of excellent MBL and CBL materials available, all of which are perfectly compatible with MOP. Also, many teachers have their own favorite lab activities (many of them from PSSC physics!), which they would do with whatever curriculum materials they were using. So, we have provided the hands-on/minds-on part, and teachers can tailor the rest of their curricula to their local needs, standards, etc. as well as their personal tastes.

If anyone has any questions about content, philosophy, or anything else, I'm happy to answer them.

Sincerely,

// Bill Leonard

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 Date: Sat, 4 Jan 2003

From: Jane Jackson <jane.jackson@ASU.EDU>

Subject: Comparison of *MINDS-ON PHYSICS* texts with Glencoe text

John Clement <clement@hal-pc.org> is an experienced high school physics teacher in Houston Texas. He knows a lot about physics education research; he posts often to PHYSLRNR listserv, and I find his insights valuable. Since he uses the new *MINDS-ON PHYSICS* (MOP) textbooks, I asked him yesterday if he could compare MOP with the Glencoe text.

> John,

> You're one of few HS teachers who seems to know much about *Minds-on*

> *Physics*. At least, you're one of only few who have posted on it. Are you

> able to compare the MOP textbooks with Glencoe?

John replied:

Absolutely. MOP has rich context problems which can be used with modeling. It might be possible to use the short reader along with modeling. It was picked by me precisely because my school wants the students to have a text. It also has the distinct advantage of coming in small volumes so students do not have to carry around 1 large book. Essentially it is a series of books on various topics with the first 3 covering mechanics. Modelers might even like some of the activities. One of the things that happens when you use MOP is that you discover problems that students have with various ideas. It also can provide ready-made activities on paper for those occasions when the teacher must be absent. ... Of all of the activities that I like, number 16, which is posted on their web site, is wonderful. Look at MOP samples.

<<http://umperg.physics.umass.edu/projects/MindsOnPhysics/default>>

Unfortunately Glencoe has the type of problems that promote novice problem solving. Even if only the problems are used from MOP, I suspect that students would develop better problem

solving skills. In addition it lays out a general procedure for solving problems, and its activities can be used with white boards. I think that it really is the best match with almost any PER curricula.

 Date: Sat, 4 Jan 2003
 From: Sherry Brown <browns@ESKIMO.COM>
 Subject: Re: Can you compare MOP with Glencoe?

At the request of Jane, I'm posting on MOP for modelers.

As far as using *Minds-On Physics* (MOP) as a text, it is not like any traditional text of chapter by chapter topics with problems at the end of each chapter. First, it is split into several volumes, each is soft cover (a disappointment, but probably keeps the publishing costs to a minimum).

If you walk through the volume on Motion, *it's clear how the models for constant velocity and uniform acceleration are developed as they are in Modeling*. In some activities, there is a walk through of how the mathematical model is developed graphically (with student responses required).

The reader is placed at the end of each volume -- so that (hopefully) kids will work through the problem sets before reading. *The readings are well done*. I have loaned my copy to kids upon occasion -- *the response has been positive using reading material as a supplement to the activities*.

MOP is laid out like the Modeling materials with room for student responses/work at each question. I can imagine how tempting it would be for kids to respond right there rather than on their own papers. I don't know what the institutional pricing is, but I can't fathom having enough money to buy a set each year for every kid.

I don't have a class set so *I adapt activities/problems from MOP into homework and white board sets*. Like I've said before, *some of them are quite challenging* -- it's helpful for my honors kids who want to crank numbers first and think later.

Fortunately, I have a copy budget that provides me with the latitude to use Modeling w/o removing response room on the worksheets (I'm thinking of those who must do this to save on paper).

One of the un-pedagogy related advantages to MOP: if you have no lockers and kids lugging 25 kg backpacks, this will be easier on the vertebrae. Honestly, I think that's one of the reasons my kids don't clamor for a text!

 Date: Sun, 5 Jan 2003
 From: Jane Jackson <jane.jackson@ASU.EDU>

[I forwarded Sherry Brown's post of yesterday, about MINDS-ON PHYSICS, to John Clement in Houston, Texas. Below is his immediate reply. - Jane]

This is a very fair response. I would like to point out that *the MOP volumes are only purchased once*. The students provide responses on answer-copyable sheets which are supplied with the teachers manual. The authors say that there is not really enough room for the responses to be written into the books.

For classroom use *I suggest that the volumes be 3-hole drilled* and then students can keep the current volume in a 3 hole binder along with current papers for the class. All current work can then fit into 1 easy to carry thin binder. I am surprised the publisher does not supply them already 3-hole drilled.

If there is no mandate by the school for a text, then just using modeling materials would be a good way to go with supplemental problems lifted from MOP. But if there is a mandate either by the school or by the parents for a text, then MOP is a good fit. The admin. at my school strongly encourages (mandates??) a text. They also interfere with textbook selection and sometimes override a teacher's preference for a plainer research based text, because the more commercial product does not look as boring.