

Title of Session: Middle Level Science Forum - The Nature of Science

Moderator: Jan Naher-Snowden

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Room: Comfy Conference Room

BJ: Welcome to the Middle Level Science discussion.

BJ: we usually start all the discussions in Tapped In with brief introductions

BJ . o O (if you're new to Tapped In go to the actions menu in the top right of this chat window and click on DETACH)

BJ: I'm an art teacher in Pennsylvania

PamelaSB: I teach Pre K and K deaf children

GailH: I am Gail Hoskins, Outreach Coordinator at the Eisenhower National Clearinghouse (www.enc.org) -- a free resource for K-12 math and science.

BethBo: Hi I am a graduate student at U of H

LoriJS: I attend the University of Akron seeking a bachelor's degree in Middle Level Education: Math and Science

ChristianW: Hi I teach grades 5/6 in Carmacks Yukon

LisaPet: I am a middle level science and social studies pre service teacher at the University of Akron

Jan_NS grins -

LoriJS smiles at Jan

RyanGst10: Hello I also attend the U of Akron studying for middle school math and science

Jan_NS: I am the discussion facilitator, part-time faculty at U. of Akron, and ...

TriciaGst11: I'm a student at the University of Akron (middle level science & S.S.)and Jan is one of my instructors

Jan_NS: slightly crazy with excitement.

Jan_NS . o O (some of my own students here!)

RyanGst10: Jan is also one of my instructors

LisaPet: as well as mine

BJ: Your students are active participants in TI, Jan!

Jan_NS: I want to welcome everyone tonight. and if any of you have questions, ideas, questions, or info to share, please feel free.

Jan_NS . o O (class assignment that many left to the last minute!)

GailH: OH is well represented tonight!

Jan_NS: ;smiles in understanding.

Jan_NS: Gail is from Columbus

Jan_NS: So everyone don't let my students dominate the discussion tonight.

PamelaSB: we wouldn't think of it!

Jan_NS: Our topic: one of the standards from NSES

Jan_NS: that applies across all grade levels.

Jan_NS: If you have websites to share, just speak up.

Jan_NS: The content standards tend to be relatively easy to address in the classroom

Jan_NS: Agreed?

PamelaSB: yes....

BethBo: yes

LisaPet: yes

GailH . o O (but there are those process ones, right?)

RyanGst10: yes I am always using them as reference

Jan_NS: yes, Gail - that is true.

Jan_NS: Exactly, Ryan

Jan_NS: the difficult ones are those related to Nature of Science

Jan_NS: as a reminder; here is an overview of those ideas that we are supposed to address.

Jan_NS: These characteristics of the nature of science include (Lederman, et al., 2001)

Jan_NS: 1.Scientific knowledge is tentative.

Jan_NS: 2.Scientific knowledge has basis in empirical evidence.

Jan_NS: 3.Scientific laws and theories are separate kinds of scientific knowledge.

Jan_NS: 4.Scientific knowledge is based upon observation and inference.

Jan_NS: 5.Scientific knowledge is created from human imagination and logical reasoning.

Jan_NS: 6.Scientific knowledge can be obtained by a variety of scientific methods.

Jan_NS: 7.Scientific knowledge is inherently subjective and based on interpretations.

Jan_NS: 8.Science is a human endeavor influenced by society and culture.

LoriJS hears a chorus of cheers from the peanut gallery

Jan_NS: Now, I know college profs who choke when they think about trying to get students to comprehend this.

Jan_NS: Any thoughts or ideas about approaching these ideas (not all at once) in middle school science?

BethBo: mix math and science- empirical evidence

Jan_NS: think about those science processes that Gail mentioned

PamelaSB: looking at how different cultures approach science....

Jan_NS: Great Pam - that is definitely an area that is often overlooked.

TriciaGst11: integrating social studies with science can bring out those cultural and societal influences

Jan_NS: science being a creative endeavor - that is an area that middle level students can understand ?

Jan_NS: that's right, Tricia

Jan_NS: any ideas on how we could do that, Tricia?

Jan_NS: Are we all thinking?

RyanGst10: some students are going to have a very hard time accepting scientific reasoning if their religion is against it

PamelaSB: yes....

Jan_NS: tell us more, Ryan

Jan_NS: reasoning in what way or context?

TriciaGst11: Hmm... scientific technology and advancements available in different countries....ex- medicines that are available here , but not in say, African countries or South American countries (?)

PamelaSB: different societies solve problems in different ways...maybe comparing and contrasting different scientific methods...

Jan_NS: That definitely brings in the societal aspects of science

Jan_NS: Great idea, Pam.

ChristianW: Some scientific theories are compatible with religious beliefs like the Big Bang Theory

Jan_NS: That is one misconception - that there is one scientific method.

Jan_NS: Thanks, Christian. that would be a way to look at theories and how they develop

PamelaSB: I don't think that the Big Bang Theory is compatible with all religious beliefs...

PamelaSB: but I'm sure that there are some theories that are

RyanGst10: well trying to explain how the earth was created through time may cause a student who believes that only god can only create change to get upset

LoriJS: so you could present all possible theories (through class research?) and let the student decide with justification - as a potential assignment

Jan_NS: that might be true. if we set that one aside - we could get embroiled in that one - what other theories could we examine. that don't bring up religious upset.

Jan_NS: That is an idea with possibilities, Lori

Jan_NS: I know that evolution is a "hot" topic that has reached the courts, etc.

LoriJS: yes, and it is our job to help students become informed - not to persuade one way or the other

ChristianW: Students can also say why they would discard certain theories, come to a conclusion and justify it.

TriciaGst11: wouldn't evolution also step on toes of religious beliefs?

PamelaSB: I have always learned and believed that when a student is asked to justify or explain something, they must truly know it

Jan_NS: How do you mean, Pam?

LoriJS: No matter what is taught, it will offend someone

LisaPet: You can explain to the students that there are different beliefs and you are exposing them to some of them.

Jan_NS: good point, Lori.

GailH: I'd suggest that perhaps this is a site <http://evolution.berkeley.edu/> that those who want to pursue this topic can explore further.

Jan_NS: that would work too, Lisa.

Jan_NS: Wow, Gail - that is the website I was going to share!

PamelaSB: I mean, if a child has to explain their beliefs, they have to truly know what they are talking about

GailH: o O (sorry!)

Jan_NS: right, Pam. thanks for the clarification.

LoriJS: I think that it has to go further than simply explaining their beliefs - research, data, etc is needed

Jan_NS: let's visit the site that Gail gave us. Just click on the link. Spend a few minutes and come back.

Jan_NS: right, Lori.

Jan_NS: Hold that thought.

GailH: There is the nature of science link there.

LoriJS: holding

Jan_NS: Right. check for clarification, definitions and lesson plans at that site, Gail please give it again.

RyanGst10: my understanding of what to say to a student that get upset about talking about evolution is that "I am not trying to say this is the only way to believe how things change but it is one idea from many" is this kind of correct?

PamelaSB: I can't get the link to work...

GailH: <http://evolution.berkeley.edu/>

BethBo: very thoughtfully done. Give a lot of balance to the discussion. Very interactive and helpful. Evolution is a science

GailH: Look behind the other windows that are open too.

Jan_NS: you should be able to just click., Pam

Jan_NS: another window should be open

BJ . o O (you may need to hold down the ctrl key as you click)

Jan_NS: thanks BJ

BJ: if you have a pop up blocker

GailH: Another quality site for educators about the issues of evolution is

<http://www.pbs.org/wgbh/evolution/>

PamelaSB: thanks

Jan_NS: I ran through the various pages discussing the NOS. - very clear and understandable.

TianaV: many classroom activities

Jan_NS: We need to set the "evolution" controversy aside and look at the issue of getting all students to understand the NOS.

LisaPet: I found this statement on the site..."Discomfort with evolution may not stem from a disagreement with science, but from the belief that evolution is incompatible with religious faith. Help students to understand that evolution, like all of science, seeks to explain natural things through natural causes. We are not challenging their religious beliefs, nor are we asking them to "believe" in evolution, but simply to learn about it."

Jan_NS: How do you feel about that statement, Lisa?

LisaPet: I agree with it. Students and people in general should be educated in many things including those they do not believe in.

Jan_NS: Important that our students recognize that science has its controversies too.

Jan_NS: Good point.

LisaPet: This will confirm the fact that they do not believe in the idea being proposed

RyanGst10: I like the statement

TriciaGst11: I think the statement Lisa found is great. We teach about other cultures in Social Studies, but don't ask students to change traditions or cultural aspects of their personal lives

Jan_NS: I agree.

RyanGst10: it answers my early question

Jan_NS: Great.

Jan_NS: Now to the practical aspects of actually dealing with NOS in the classroom

Jan_NS: here is another good website with lessons that address various aspects of NOS.

Jan_NS: <http://www.indiana.edu/~ensiweb/natssc.fs.html>

Jan_NS: click on the "List of titles"

Jan_NS: then read the synopses.

Jan_NS: visit a few.

Jan_NS: then come on back

ShannanM: I like that site!

TianaV: the horoscope syn. interested me

Jan_NS: All three of the sites we have given you tonight are excellent and are created by science educators and scientists who are concerned about science education.

PamelaSB: getting kids to make hypothesis and actually learning through experiences whether their thinking is right or wrong is one of the best ways for kids to learn

Jan_NS: Build an understanding of NOS by using inquiry activities - then reinforce their scientific thinking.

Jan_NS: You are right, Pam

ShannanM: I'm curious.... the PBS site mentioned Faith and Science..... are teachers allowed to talk or teach anything about that?

Jan_NS: any thoughts, everyone?

RyanGst10: I like this site in that it asks the students to think and then explain their thinking and reasoning and answers

Jan_NS: I agree, Ryan.

LisaPet: I would think that it would all depend on the school.

Jan_NS: in what way?

TianaV: probably not, it's like sex ed. I'm sure parents want to discuss with their children. That's where most belief systems begin.

ShannanM: I thought it would be more standardized

Jan_NS: tell us more, Shannan

LisaPet: That some "small town" schools may be ok with it because everyone has the same beliefs. Where a larger school with a diverse population may have an issue with issues regarding faith being taught

LoriJS: think of the schools that are now eliminating holiday parties, and are simply celebrating the seasons

Jan_NS: taught or "discussed" as a way of clarification

Jan_NS: good point, Lori

ShannanM: Well, with the way the court system is nowadays.... I figure teachers aren't even allowed to mention religion!

RyanGst10: in many of my core classes suggest that inquiry activities are some of the best way to get students to learn

LoriJS: the whole concept revolves around the so-called concept of separation of church and state

Jan_NS: maybe, faith related topics could be explored as an inquiry project?

Jan_NS: Now there is a kettle of fish - Lori

LoriJS likes kettles of fish - what ever that slogan means

Jan_NS: so we really have several issues to deal with

RyanGst10: with the courts getting involved they seem to be hindering us from teaching anything, letting the parents be involved as to what is being taught may help or may not

LoriJS: I think that faith projects are alright if there are opportunities for all parties to have a say - that is usually what they are fighting for

Jan_NS: true.

LoriJS: that, or either they don't want to be exposed to any sort of religious thinking

Jan_NS: not an easy answer to the religious relationship to science teaching.

LoriJS: It always seems to come back to that

TriciaGst11: If parents will fight to have their kids not say "one nation Under God..."...I'm sure there are some parents who will freak out about other aspects of school that mix church and state

ShannanM: I don't understand why you can't teach religion.....you are not trying to make the student believe in a specific faith but teaching them about it

ShannanM: you could just as well teach them about Buddhism

ShannanM: or whatever

LoriJS: but the problem is that if you are teaching one faith, another is being required to hear/learn/know about it - big problem for some

LoriJS: and most do not teach the full spectrum either

Jan_NS: that is where we all need to have a good grasp of Nature of Science so we can keep the distinction between what is good science procedure and understanding and what is faith based statements or concepts

ShannanM: well, they could....

LoriJS: but most don't...

ShannanM: o.k. that's true

RyanGst10: Jan I have to leave because the lab I am in is closing but I can be back in about 10 minutes

Jan_NS: not sure if we can ever resolve the debate on "teaching religion"

ShannanM: probably not

LisaPet: I will agree with you on that

Jan_NS: Ryan - we are winding down and will finish up around 10

LoriJS: they haven't been able to for how many years?

Jan_NS: seems like forever.

ShannanM: But what a tough position to be in if the subject comes up.....like in that PBS lesson!

RyanGst10: ok well then thanks for letting me discuss and everyone have a great night

LisaPet: Bye Ryan

TriciaGst11: kind of sad that people won't open their minds up to learning about different concepts/beliefs

Jan_NS: so, maybe knowing how to bring the lessons back to the NOS and defusing the religious objections is the direction we need to take.

TianaV: it's really big here in Texas

Jan_NS: I can imagine.

RyanGst10 left the room (signed off).

PamelaSB: It's amazing what people will argue about for the sake of arguing

Jan_NS: Very true. Our job is know when to "redirect" as they say in the courtrooms of American

Jan_NS: How comfortable do you feel about teaching NOS?

LoriJS: but those who argue on this point are truly passionate (for the most part) or really adamant...we are all entitled to our opinions

Jan_NS: acknowledging opinions is important.

ShannanM: What a damper that puts on student debating

PamelaSB: we are all titled to our opinions, and we also have the freedom of speech....

Jan_NS: But some folks don't recognize that their opinions are just that - opinions.

PamelaSB: that is definitely true

TianaV: I'd feel more comfortable w/ more resources

Jan_NS: what type of resources, Tiana?

PamelaSB: I feel pretty comfortable....

PamelaSB: I have to run. Thanks Jan.

TianaV: the schools here aren't

LoriJS: but as we are sitting here not comprehending someone who does not want faith mixed in with science...there may be a chat room full of people doing the exact opposite. So we also must open our eyes to a different understanding and be willing to teach in a sterilized, non-personal classroom

PamelaSB left the room (signed off).

Jan_NS: Thanks for participating, Pam

LoriJS smiles as she watches Jan shout that down the "hallway" to Pam

ShannanM: Well that's the way it is

Jan_NS: Great point, Lori.

Jan_NS: . o O (well, I tried - guess my fingers aren't too good at "shouting")

BJ: thanks for being here, Jan!

Jan_NS: Well, I think we can agree that NOS is definitely part of the discussion.

LoriJS: sure

Jan_NS: Thanks for coming tonight, everyone.

SusanR: Thanks, Jan

ShannanM: Thank you

LisaPet: Thanks for the resources

Jan_NS: Hope you have some food for thought and good resources to take home.

TriciaGst11: Thank you...Great discussion! and, great resources!

Jan_NS: come again!

ShannanM: Have a great night

Jan_NS: Night everyone.

BJ: see you in January when we'll get back to a normal schedule

Jan_NS: Have a great Thanksgiving