Title of Session: NanoSense
Moderator: Anders Rosenquist and Tina Stanford
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Room: NanoSense Group

BJB2: Welcome to this special NanoSense Discussion!

DavidWe is excited

BJB2: as you all know we usually start all the Tapped In discussions with introductions

BJB2: please let Anders know where you are located and what interests you about the topic

DavidWe: I'm David Weksler. I'm a HelpDesk volunteer and I lead a math education and technology discussion in Tapped In. I'm in New Jersey (cold), not far from New York City

MarleneK: I'm in Edmonton Alberta, a junior high science teacher.. and excited about this topic because its something that I can pass on to my students.

AndersR: just found that

BJB2: I'm in central Pennsylvania and am always interested in anything with "sense" in it

DavidWe smiles

AndersR smiles

DavidWe . o O (BJ is wise in the ways of the world)

AndersR: And I'm Anders Rosenquist

AndersR: I live up in Seattle, but work remotely on several projects with SRI International where the NanoSense team mainly resides

AndersR: I was a teacher for about 6 years

DavidWe: In the Seattle area, Anders?

AndersR: 4 years high school science (chem and physics)

DavidWe smiles

AndersR: and 2 years grade school science (and full 2nd grad teacher)

DavidWe: cool!

TinaS joined the room.

DavidWe waves to Tina

AndersR: hi Tina

MarleneK smiles.

AndersR: can you introduce yourself Tina?

TinaS: I am part of the NanoSense team

TinaS: I taught high school for 17 years (biology and chemistry)

TinaS: Am living in Menlo Park CA

DavidWe cloned a gene once

TinaS: AWESOME!

DavidWe . o O (cookbook chemistry)

DavidWe smiles

AndersR: OK - let's jump in

AndersR: I'm not sure how familiar you are with the NanoSense (NS) project

DavidWe remembers being to one previous Nanosense discussion

MarleneK peeked at the website.

AndersR: but basically it is an NSF funded curriculum development project focused on high school and middle school

AndersR: nanoscience

AndersR: We are in our third year of development

TinaS: Marlene, do you want to teach nanoscale science in your classes?

MarleneK: I think there is a future possibility of that. Currently I'm not in the classroom this year.

AndersR: We have 2 units finished - Size Matters and Clear Sunscreen. Both of which can be downloaded from our website at http://nanosense.org

AndersR: And we are working on two more units - Clean Energy and Fine Filters

MarleneK: Whatever I learn here I will be passing on to colleagues.

TinaS: Excellent

AndersR: the Clean Energy unit is what we are taking a look at today

TinaS: maybe Marlene would like a little overview before jumping in

AndersR: it is still in draft form, but it is basically a two to four day unit that focuses

AndersR: on current energy production

AndersR: and our reliance on fossil fuels

AndersR: and how we need to be thinking ahead to alternative sources of energy

MarleneK goes to the Clean Energy webpage

AndersR: Good - let's all go to the Clean Energy part of the nanosense site: http://nanosense.org/activities/cleanenergy/index.html

MarleneK: Do teachers need to go through the Clear Sunscreen unit before doing this one

DavidWe is there

AndersR: Instead of me trying to type the whole description, we can all look at this page and I can highlight parts of it and respond to questions

AndersR: no

TinaS: No, but it might be helpful to look at the introduction materials SizeMatters

AndersR: yes

TinaS: we talk about what nanoscale technology is

MarleneK: Yes, I found that first unit to be very helpful... great job on the intro

BJB2: Patti also has a doc on CE Unit under featured items in this group room

TinaS: Thanks!

AndersR: yes

BJB2 . o O (both a link and a file)

AndersR: how about we all grab the "CE UnitGlance1-19-07.doc"?

AndersR: this is a more detailed overview of the unit

AndersR: with information on the learning goals and outcomes

AndersR: this doc is in the NanoSense room

DavidWe: What sort of background to students (and teachers) need for these topics, Anders?

BJB2:
http://tappedin.org/tappedin/do/FileAction?ROOM_ID=9537&FILE_ID=39124&state=doDownloadFile

AndersR: nice - thanks BJ

AndersR: yes

AndersR: looks like it is downloading - just opened

AndersR: thanks

AndersR: this is a quick two page document

DavidWe nods

AndersR: the first page talks about the two parts to the unit and how they are modular

AndersR: So if you only had a day to do something related to energy, you could choose if you wanted to focus on the energy issues or on solar technologies

AndersR: The second page of this document is a table

DavidWe: that's cool

MarleneK: That's very good.

AndersR: that gives a breakdown of each lesson, the number of days, learning goals, etc

AndersR: kind of a lesson plan for the unit

AndersR: One thing to note: we also created a pretty detailed document

AndersR: showing how all the parts of this unit map to the NSES standards

AndersR: so that you have some alignment information

DavidWe: that's cool

AndersR: As you know, we've found that "nanoscience" doesn't really show up in many standards

DavidWe smiles

DavidWe: I'm sure

AndersR: however, if you wanted to teach some nano in your chem course or intro to science course

MarleneK: Having the modules also makes it easy to integrate into other curriculums as well.

DavidWe smiles

AndersR: the alignment chart can help you decide where it might fit

AndersR: I agree Marlene - we wanted to give teachers as much flexibility as possible

AndersR: in implementing our NanoSense units

AndersR: since it is difficult to take time away from your normal curriculum

MarleneK nods.

DavidWe: do teachers need some background/professional development before they undertake this?

TinaS: Our Intro could take anywhere from 1 week to 1.5 or even 2 weeks

AndersR: well, what we decided on background was that we'd include detailed "notes" to go along

AndersR: with all the presentation materials

AndersR: so these give some good background information

AndersR: for example, in the clean energy unit we have two slide presentations, each about 1-18 slides long and take about 30-45 minutes

AndersR: they are used for class discussion

AndersR: each slide has background info

DavidWe nods

AndersR: what might be helpful is if we all go back over

AndersR: to the nanosense website

AndersR: http://nanosense.org/activities/cleanenergy/index.html

AndersR: and take a look under "Lesson 2"

AndersR: you should see a link to grab the Clean Solar Energy powerpoint presentation

DavidWe nods

AndersR: wait, I forget that I can give you the link:
http://nanosense.org/activities/cleanenergy/solarenergy/CE_SolarSlides.ppt

DavidWe smiles

AndersR: If you can grab these, I can take a few minutes to talk about them

MarleneK is downloading as we speak.

DavidWe: nice graphic on the first slide

MarleneK: I really liked how you make the downloads into small packages...

TinaS: It seemed necessary-

TinaS: to make these more portable

MarleneK nods.

TinaS: Thanks.

AndersR: You can grab the teacher notes that go along with this powerpoint: http://tappedin.org/tappedin/do/FileAction?ROOM_ID=9537&FILE_ID=39126&state=doDownloadFile

TinaS: That was done by our friend Aaron

AndersR: let me know if you are not able to grab the powerpoint and the teacher notes files

MarleneK has them both now.

AndersR: sounds like everyone has these two files open then?

AndersR: so this is the day two presentation that focuses on solar energy

TinaS: The second slide is designed to allow teachers to brainstorm with students the top 10 global problems.

AndersR: it steps through what solar energy is, what energy demand looks like, and how solar panels are used today

AndersR: the focus is mainly on differences between traditional silicon-based solar cells

AndersR: and newer, nanocrystalline solar cells

DavidWe smiles

MarleneK nods.

AndersR: it points out that these newer nano-based solar cells have great potential since they are easier and cheaper to make

AndersR: and are more flexible

AndersR: If you look at the teacher notes you can get a sense of the level of background we provide

AndersR: I should note too that the Clean Energy unit

AndersR: unit was just tested two weeks ago

AndersR: in two high school classrooms (about 50 student total)

DavidWe hopes it passed the test

AndersR: I am in the process of going through all the feedback and making a list of edits

TinaS: Students like doing the unit

AndersR: yes - I think the students enjoyed it

TinaS: It gave them a feeling that they were participating in cutting edge science

AndersR: the teacher was good - she gave some good feedback

TinaS: Some of them were a little lost with the details on both processes

AndersR: to our team to help make the materials better

TinaS: but most got a good overall picture

AndersR: the two classes were environmental science - mainly frosh/soph

AndersR: a pre-chem class

DavidWe nods

AndersR: or physical science requirement

AndersR: - just to give you a sense of who used it

AndersR: I am making edits, so expect version 2.0 within the next few weeks

DavidWe smiles

AndersR: as part of this unit there is an optional lab

AndersR: that takes one to two days

MarleneK: Wow it only takes approx 3 months to produce energy savings equivalent to cost of production

AndersR: it is a kit made by Institute for Chem Ed (ICE)

AndersR: yes - good returns on nano

AndersR: we found that the kit, off the shelf, did not work very well

AndersR: the teacher who tested the unit is actually making a revised version of the lab

AndersR: that we will post as well

AndersR: the lab has student actually build nano solar cells and then test them

DavidWe: very cool

DavidWe: They can see that the cells they build generate energy?

AndersR: yes - they hook them up to voltmeters

TinaS: theoretically

DavidWe smiles

AndersR: good point!

AndersR: yes, assuming care is taken when making the cell

MarleneK nods.

DavidWe: Excuse me for a few minutes, folks

TinaS: The teacher had problems preparing the solar stuff

DavidWe left the room.

AndersR: so the whole Clean Energy unit is basically the two powerpoint slide sets (with notes), the 1-2 day lab

AndersR: and a student reading on nano that we are currently developing

AndersR: this can be used as a homework assignment for in-class discussion

AndersR: we were using an article from Scientific American, but we decided to make our own so that we can easily reproduce and share it

MarleneK nods.

TinaS: The slides are pretty instructional as well

BJB2: this will be available on the site as a package?

AndersR: If you go back to the nanosense site, you can download the who unit as a pdf file

TinaS: Everything but the lab, which you will have to order.

AndersR: yes BJ - we are in the process of putting all the files up on the NanoSense website

AndersR: so that people can pick and choose what they want to use

MarleneK: Is the equipment in the lab kit reusable?

AndersR: I should note - the first set of slides that give an intro to the CleanEnergy unit

TinaS: Yes

TinaS: The amount of material can cover several uses

AndersR: have some video clips of Richard Smalley in them talking about the energy problem

TinaS: You would have to clean the slides each time though

AndersR: this makes the download bigger

AndersR: but they are interesting

AndersR: sorry - two strands of discussion going on

MarleneK follows.

AndersR: So that's the unit in a nutshell

AndersR: I'd suggest downloading the full pdf file and browsing through all the pieces

BJB2 . o O (big nutshell!)

AndersR: Yes.

AndersR: ironically, this is one of our smaller units

BJB2: How long has it taken you to develop this unit?

AndersR: Clear Sunscreen and Size Matters are much bigger

MarleneK: It seems like such a viable alternative.. why aren't more companies and gov. getting on the band wagon with this technology?

AndersR: I started on Clean Energy in the summer

AndersR: and I still have some work to do to refine it

AndersR: that's why you don't see all the pieces as downloads off the NanoSense website yet

BJB2 nods

AndersR: they are still drafts and we are still iterating on them

TinaS: The pdf has all of the elements, but the slides are an overview rather than ppts. The ppts. can be downloaded separately. That makes the pdf much, much smaller. For instance, the slides are 2 to a page.

AndersR: my goal is to have this unit "done" within the next month or so...

AndersR: going back to Marlene's question

BJB2: Thanks for sharing the project with us! Perhaps you can do this again with some of the other units so the TI members can learn more about them.

BJB2 sits on her hands and stops interrupting

TinaS: I agree with you Marlene. The government should get on the bandwagon!

AndersR: there are several factors with not using the nanocrystalline cells yet - the efficiency is still below 10% and I don't think the production scales well yet, meaning that they can make small ones, but big ones are very expensive

AndersR: I agree too!

TinaS: Research is ongoing to work out these problems

AndersR: I know we hit the hour mark

AndersR: I'm available for questions

TinaS: so it is really important that research be funded to pursue alternate sources of energy

MarleneK: What type of power could you get from a small one? Enough to light up your house, or smaller than that?

AndersR: via email:**AndersR**@stanfordalumi.org

AndersR: much smaller

AndersR: right now they are used mainly for smaller installments

MarleneK nods.

TinaS: Thanks for coming everyone!

AndersR: like (and don't quote me on this yet) requirements below a few watts

AndersR: if even that

MarleneK: Thank you very much for the work that you put into this unit and the others.

AndersR: you bet

AndersR: please spread the word

MarleneK: I will do that.

AndersR: we would love for many, many people to use our (free) materials

BJB2: Thanks, Anders and Tina!

AndersR: I hear Tina typing

TinaS: And send us evidence of student/teacher learning from your colleagues if you can!

AndersR: yes, that is always good - want to make sure students are actually learning something (and remembering it!)

MarleneK: Right.. so you can show that it is working... and you can get more funding

AndersR: Great - thanks everyone for coming

AndersR: thanks BJ for helping facilitate

AndersR: Marlene raises a good point

AndersR: the answer is "yes"

TinaS: Bye!

AndersR: bye!

BJB2 waves bye

AndersR waves bye

MarleneK: Thanks again

MarleneK waves.