



LIVE INTERACTIVE LEARNING @ YOUR DESKTOP

Aligning ExploraVision with the National Science Education Standards and the NRC Framework for K-12 Science Education

Presented by: Courtney Georginn and Eric Crossley

October 10, 2012

6:30 p.m. – 8:00 p.m. Eastern time



Introducing today's presenters...

Eric Crossley

National Science Teachers Association



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Willow Grove Elementary

San Diego, CA





Today's Agenda

1. Introducing the Competition

What is ExploraVision and how can I use it?

Why should students participate?

Prizes offered

2. Aligning ExploraVision with the National Science Education Standards

3. Aligning ExploraVision with the NRC Framework for K-12 Science Education

4. Tips, Suggestions & Resources for Teachers





“Aligning ExploraVision with the National Science Education Standards for K-12 Science Education and the NRC Framework for K-12 Science Education ”

1. Introducing the Competition



1. Introducing the Competition



Have you participated in ExploraVision or are you familiar with the competition?

- A. I have participated in ExploraVision
- B. I haven't participated, but I am familiar with it
- C. I haven't participated and I don't know much about it



1. Introducing the Competition

Sponsored by Toshiba



Administered by NSTA





1. Introducing the Competition

What is ExploraVision? Why should students participate?

- Competition for all K-12 students that provides a turnkey learning setting for building skills – problem solving, teamwork, communication, and critical thinking, **FREE to enter and everyone receives a gift!**
- A hands-on and fun but well-structured science framework that inspires students
- Designed for students of all interest, skill, and ability levels
- Students work in teams of 2-4 to select a technology, research how it works and why it was invented, then project how it may change in the future



1. Introducing the Competition

What is ExploraVision? Why should students participate? (Continued)

- Open for public/private/parochial/home schools in U.S. and Canada
- Each team is guided or led by a teacher and optional mentor
- Easy to enter through online registration/mailed projects
- Now more aligned with the National Research Council's Framework for K-12 Science Education!
- Multiple projects allowed = perfect for introducing to your classroom



1. Introducing the Competition

About the competition

- Grades K-3
- Grades 4-6
- Grades 7-9
- Grades 10-12

Each grade category is judged separately

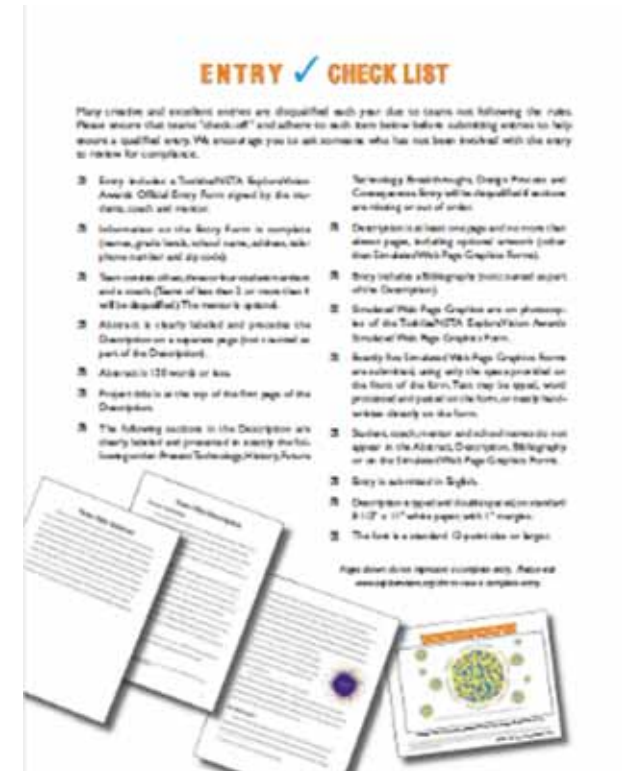




1. Introducing the Competition

Project Components

1. Abstract
2. Description
 - 1) Present technology
 - 2) History
 - 3) Future technology – 20 years
 - 4) Breakthroughs
 - 5) Design Process
 - 6) Consequences +/-
4. Bibliography
5. Sample Web Pages





1. Introducing the Competition

Everyone's a Winner!

- Gifts and certificates for all students, teachers, and mentors, and discount for Toshiba computer products
- Honorable Mention Awards for 500 teams
- 24 Regional Winners; Toshiba laptop for each winning school and Toshiba HD camcorder
- Eight National Winners; expense paid trip to D.C. and to be on air with Bill Nye the Science Guy





1. Introducing the Competition

National Winners

- Eight teams
- Four first-place student team members each receive a \$10,000 U.S. savings bond (maturity)
- Four second-place student team members receive a \$5,000 U.S. savings bond (maturity)
- All team members attend gala awards weekend in Washington, D.C.





1. Introducing the Competition

Prize Pack Giveaways

For the schools

- The school with the largest number of qualified teams will receive a \$1,000 tech upgrade from Toshiba



For the teachers

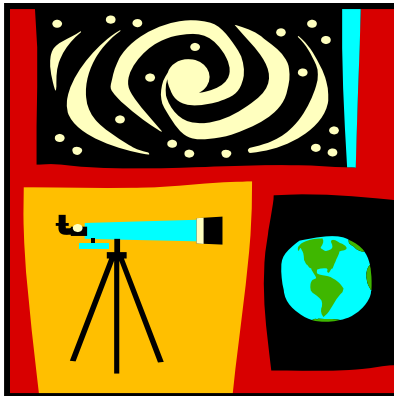
- The coach in each grade level with the largest number of qualified teams will receive his or her very own Toshiba Tablet





1. Introducing the Competition

Winning ideas have focused on things as simple as ballpoint pens and as complex as nanotechnology applications.





Let's pause for questions.





“Aligning ExploraVision with the National Science Education Standards for K-12 Science Education and the NRC Framework for K-12 Science Education ”

2. NSES



2. ExploraVision: National Science Education Standards



The Curriculum Is Already So Time Consuming...

- ExploraVision does require extra work for both teachers and students, but it is an excellent way to incorporate the National Science Education Standards into your class, to motivate students, and to help them learn to organize and communicate what they learn.





2. ExploraVision: National Science Education Standards



Which standards do you believe closely align with ExploraVision?

	Performance-based assessments of science and problem-solving abilities
	Engaging students in problem-solving and critical thinking activities
	Teaching students responsibility for their own learning
	Building strong communication skills
	Working in cooperative learning groups
	Stressing science is for <u>all</u> students
	Encouraging interdisciplinary learning



2. ExploraVision: National Science Education Standards



Standards Goal

- Moving towards performance-based assessments of science and problem-solving abilities

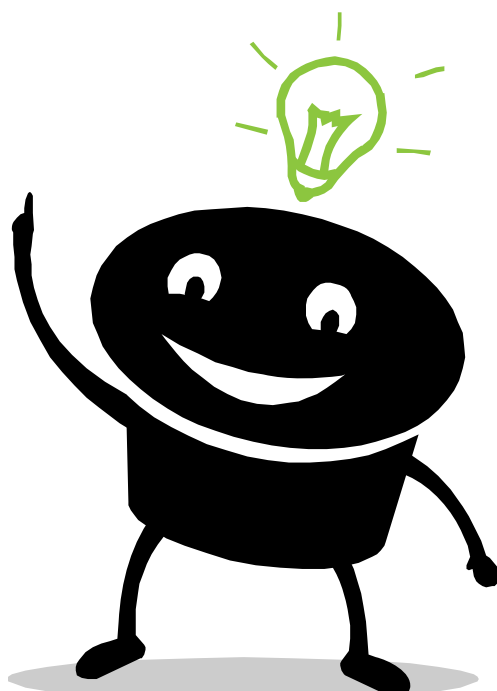
ExploraVision Opportunity

- ExploraVision requires that students write, draw and present their conclusions. This work can assist your assessment of the students' learning.





2. ExploraVision: National Science Education Standards



Standards Goal

- Engaging students in problem-solving and critical thinking activities

ExploraVision Opportunity

- Designing ExploraVision projects provides an excellent opportunity for inquiry-based learning.



2. ExploraVision: National Science Education Standards



Standards Goal

- Teaching students responsibility for their own learning

ExploraVision Opportunity

- ExploraVision requires student commitment and initiative, challenging students to take an active role in their learning.





2. ExploraVision: National Science Education Standards



Standards Goal

- Building strong communication skills

ExploraVision Opportunity

- ExploraVision provides multiple opportunities for students to communicate verbally and in writing, as well as through art and technology.





2. ExploraVision: National Science Education Standards



Standards Goal

- Working in cooperative learning groups



ExploraVision Opportunity

- ExploraVision projects are put together by teams of 2–4 students who must work together effectively if they are to be successful.



2. ExploraVision: National Science Education Standards

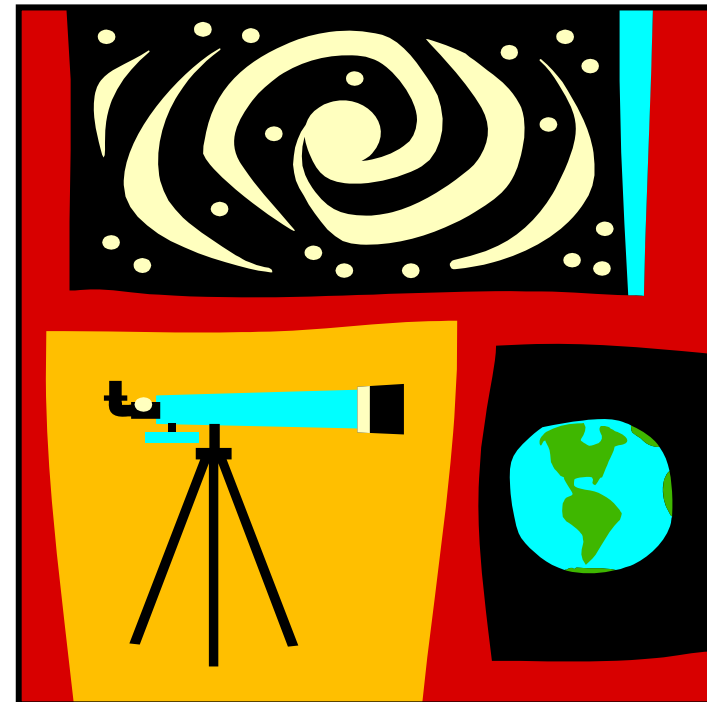


Standards Goal

- Stressing science is for all students

ExploraVision Opportunity

- ExploraVision is for all students, not just the more academically motivated.





2. ExploraVision: National Science Education Standards



Standards Goal

- Encouraging interdisciplinary learning

ExploraVision Opportunity

- ExploraVision teams must use language arts, math, and social studies skills in addition to science.





2. ExploraVision: National Science Education Standards



The process of putting together an ExploraVision entry will help your students understand:

1. The importance of invention in history
2. The scientific breakthroughs required to create an invention
3. The gradual “building block” nature of scientific progress
4. How science relies on constant improvement of technological tools in order to progress
5. That all new technologies have both positive and negative impacts on our lives



“Aligning ExploraVision with the National Science Education Standards for K-12 Science Education and the NRC Framework for K-12 Science Education ”

3. NRC Framework



3. Aligning ExploraVision with the NRC Framework for Science Education

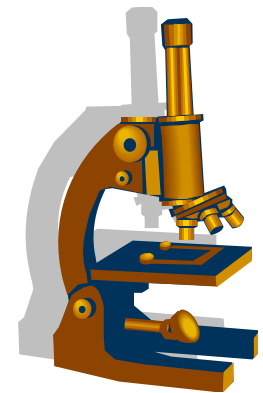
ExploraVision now more closely aligns with the National Research Council's Framework for K-12 Science Education:

Asking Questions and Defining Problems – Present Technology

- **Engineering** begins with a problem, need or desire that suggests an engineering problem that needs to be solved.

Defining and Delimiting an Engineering Problem – Future Technology

- *What is a design for?*
- *What are the criteria and constraints of a successful solution?*





3. Aligning ExploraVision with the NRC Framework for Science Education

ExploraVision now more closely aligns with the National Research Councils Framework for K-12 Science Education:

Planning and carrying out investigations - Breakthroughs

- **Engineers** use investigation both to gain data essential for specifying design criteria or parameters and to test their designs.

Constructing explanations (for science) and designing solutions (for engineering) – Design Process

- Each proposed solution results from a process of balancing competing criteria of desired functions, technological feasibility, cost, safety, esthetics, and compliance with legal requirements.





3. Aligning ExploraVision with the NRC Framework for Science Education

ExploraVision now more closely aligns with the National Research Councils Framework for K-12 Science Education:

Links Among Engineering, Technology, Science, and Society - Consequences

- *How are engineering, technology, science, and society interconnected?*

Developing and using models – Sample Web Pages

- **Engineering** makes use of models and simulations to analyze existing systems so as to see where flaws might occur or to test possible solutions to a new problem.





Let's pause for questions.





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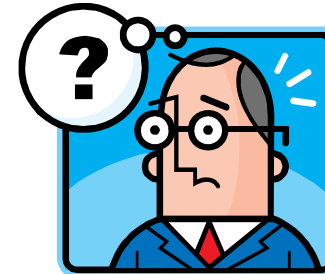
4. Tips, Suggestions, and Resources for Teachers



4. Tips, Suggestions, and Resources for Teachers

Where to begin?

- Bring your class together and ask them to brainstorm a list of problems in the world.





4. Tips, Suggestions, and Resources for Teachers



Next Steps

- Revisit your list of problems and ask if anyone has an idea on how to solve one or more of the problems.
- Remind them that these ideas may seem impossible now, but they are inventing an idea for 20 years in the future.
- Go big!

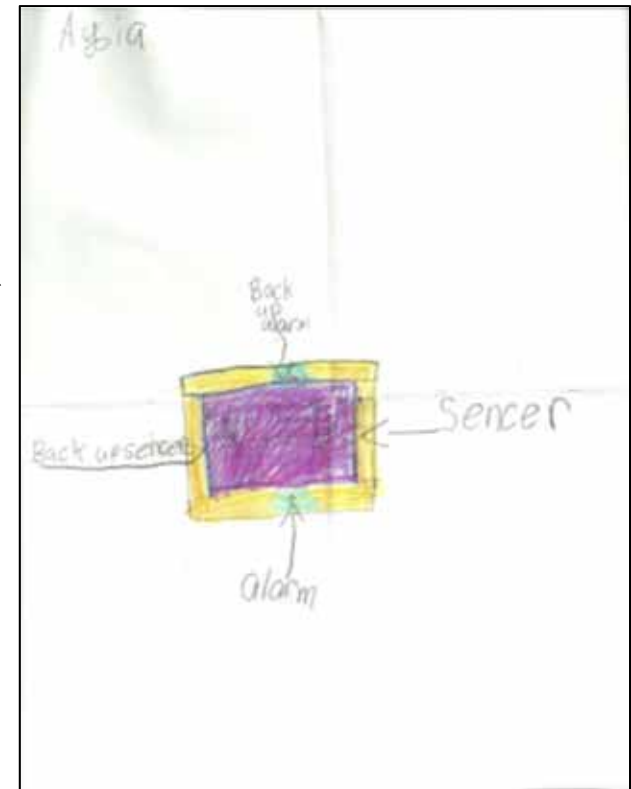




4. Tips, Suggestions, and Resources for Teachers

Ask your kids to pick a project that interests them the most.

- Once they gotten into groups, ask the kids to individually draw a picture of what their project will look like and what it can do.

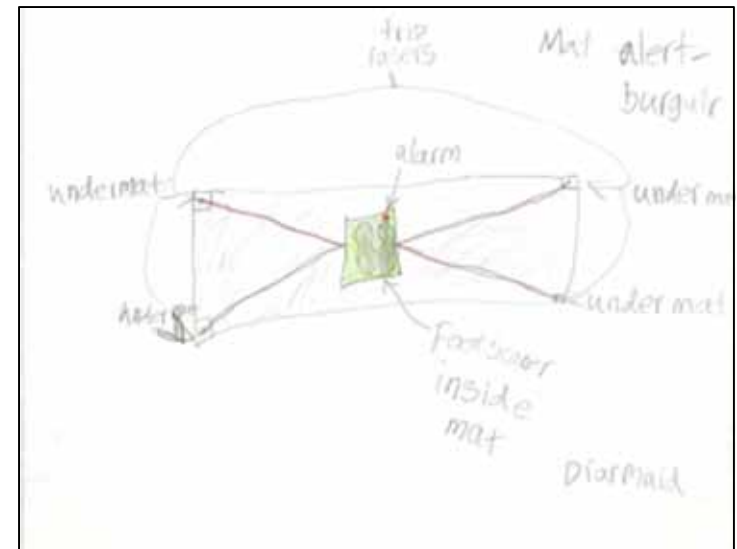




4. Tips, Suggestions, and Resources for Teachers

Have them compare their pictures.

- They should create a list of things they like from each picture.
- Now they should create one picture incorporating aspects they liked from all individual pictures.
- Keep all pictures, papers, and notes in a folder to help maintain organization of each group.





4. Tips, Suggestions, and Resources for Teachers

Writing the report of the project is the hardest part for the groups.

- It is best to “chunk” the report into sections.
- Typically, it is easiest for the kids to start with the future technology because it is simply describing the project they have already illustrated in written words.
- Here is the framework that I provide for each group and they must keep it in their project’s folder.



Name of Project _____

Abstract

Brief overview of your project



4. Tips, Suggestions, and Resources for Teachers

Ask Questions!

- Do not tell them they can't add something to their project, instead you can ask questions about how and why.
- Asking thought provoking questions is one of the best parts of the ExploraVision project.



4. Tips, Suggestions, and Resources for Teachers

Creating the Web Pages

- Show the students actual web pages selling a product online.
- Ask them to tell you their favorite part of the website.
- Point out the basic features of a website, such as buttons, graphics, and content.



4. Tips, Suggestions, and Resources for Teachers

Web Page Creating - Next Steps

- Have the students pick the 5 pages they would like to construct.
- Let the students create the graphics and choose the fonts for each page.



4. Tips, Suggestions, and Resources for Teachers

Possible Timeline for Project Completion

- Brainstorming/project formation
 - October
- Writing rough draft of each section
 - November/December
- Web pages
 - January
- Final draft of report
 - January



4. Tips, Suggestions, and Resources for Teachers

Visit the ExploraVision web site:

<http://www.exploravision.org>

- How to register and enter online
- How to obtain project materials
- The entry steps
- Web seminar archive
- Prizes, rules and FAQ's
- Past winners showcase
- Videos of interviews from teachers and students
- Sample timelines



4. Tips, Suggestions, and Resources for Teachers

- Join the ExploraVision Facebook community at:
<http://www.facebook.com/ToshibaInnovation>
- Or follow ExploraVision on Twitter at:
www.twitter.com/ToshibaInnovate



Thank you!

Other questions?

Please email exploravision@nsta.org or call
1-800-EXPLOR-9



Let's pause for questions.





Thanks to today's presenters!

Eric Crossley

National Science Teachers Association



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