



# *Indiana STANDARDS FOR TECHNOLOGICAL LITERACY*

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# Logistics

- ◆ Introductions
- ◆ Workshop Registration/Evaluation Forms
- ◆ TEI & ITEA Membership Forms
- ◆ Why is professional involvement & activity important? What MIGHT I get out of it? What MIGHT my students get out of it?
- ◆ Advocacy and Public Relations is best conducted by the people who are actually doing the job!

# What you will gain from this workshop...

- ◆ An overview of the components that affect student learning
- ◆ An overview of *the Indiana Standards for Technological Literacy*
- ◆ Suggestions on how to begin the implementation process

# Who is a technologically literate person?

## Understands:

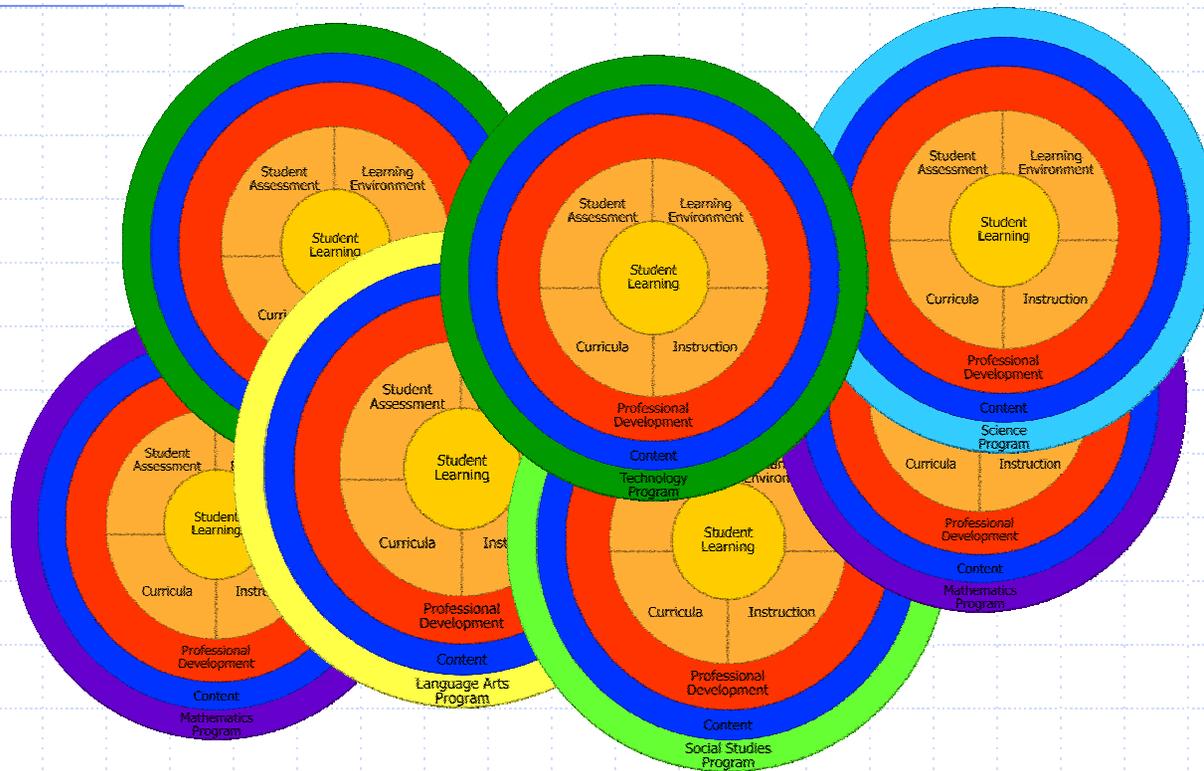
- What technology is
- How technology is created
- How the use of technology shapes society and in turn,
- How society shapes the development of technology



“With the growing importance of technology to our society, it is vital that students receive an education that emphasizes technological literacy.”

(ITEA, 2000, vii)

# REALITY! Overlap is good!



- This is a good thing for students!!
- In the real world learning is not compartmentalized!!!
- In brain research making areas connect is BEST!!!!

# Terminology

- ◆ **Technology** is the modification of the natural environment in order to satisfy perceived human needs and wants.
- ◆ **Technological literacy** is the ability to use, manage, assess, and understand technology.
- ◆ **Technology Education** is a study of technology, which provides an opportunity for students to learn about the processes and knowledge related to technology that are needed to solve problems and extend human capabilities.

# What is Technological Literacy?

- ◆ Indiana's *Standards for Technological Literacy*: Defines technological literacy as the ability to use, manage, assess, and understand technology.
- ◆ Technological literacy, like other forms of literacy, is what **every** person needs in order to be an informed and contributing citizen for the world of today and tomorrow.
- ◆ Technological literacy is more a capacity to understand the broader technological world rather than an ability to work with specific processes of it. (NAE/NRC, 2002)

# Some Simple Misconceptions

- ◆ Technology is applied Science

“The lack of technological literacy is compounded by one prevalent misconception: When asked to define technology, most individuals reply with the archaic and mostly erroneous, idea that technology is applied science” (Bybee, 2000, pg. 23).

- ◆ Equating technology education with teaching computers and information technology

- ◆ Confusing technology education as hands-on, and therefore, not as challenging as academic subjects.



“... the goal of technological literacy is to provide people with the tools to participate intelligently and thoughtfully in the world around them.”

(NAE & NRC, 2002, p. 3)

# Components that Affect Student Learning

- ◆ Content
- ◆ Curricula
- ◆ Instruction
- ◆ Learning Environments
- ◆ Student Assessment
- ◆ Professional Development
- ◆ Programs

# A Closer Look at the Components

## Content

- *Indiana Standards for Technological Literacy*
- **Seventeen Standards**
  - ◆ General Technological Concepts
  - ◆ Designing & Producing Technology
  - ◆ Using & Assessing Technology
  - ◆ Multiple “contexts” to study the depth and breadth of the technological world.
    - *Introductory (middle school)*
    - *Systems (9<sup>th</sup> grade)*
    - *Processes (10<sup>th</sup> grade)*
    - *Applications (11<sup>th</sup> grade 12<sup>th</sup> grade)*

# A Closer Look at the Components

## ◆ Curricula

The way content (*ISTL*) is delivered

Structure

Balance

Organization

Presentation

- Enable all students to attain technological literacy
- Designed across grade levels and disciplines

*ISTL* is NOT curricula.

# A Closer Look at the Components

## Instruction

The teaching process employed to deliver content (*ISTL*)

- Consistent with research on how students learn technology
- Coordinated with curricula
- Enable all students to attain technological literacy
- Incorporate educational technology
- Utilize student assessment

## A Closer Look at the Components

### ◆ Learning Environments

Formal or informal location where learning occurs

- Facilitate technological literacy for all students
  - ◆ Support student interactions
  - ◆ Support student abilities to question, inquire, design, invent, and innovate
  - ◆ Up-to-date and adaptable

## A Closer Look at the Components

### ◆ Student Assessment

The systematic, multi-step process of collecting evidence on student learning, understanding, and abilities and using that information to inform instruction and provide feedback to the learner, thereby enhancing student learning.

## A Closer Look at the Components

### ◆ Professional Development

A continuous process of lifelong learning and growth that begins early in life, continues through the undergraduate, pre-service experience, and extends through the in-service years.

## A Closer Look at the Components

### ◆ Content & Context

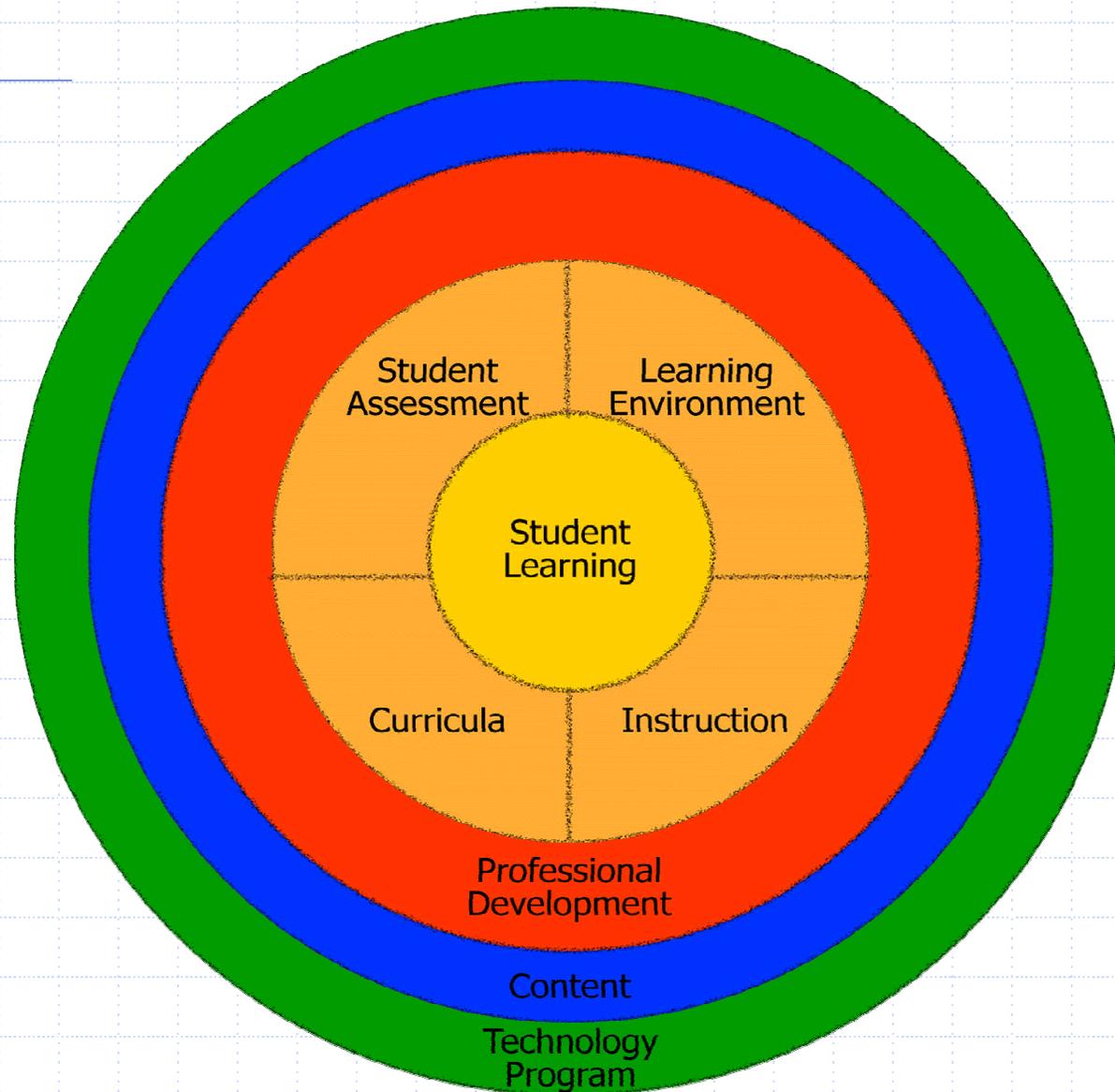
The content of student learning is aimed at developing the intellectual, academic, social, moral, and physical growth of students. The goal is to meet the needs of students to grow and learn. Standards are used to measure growth.

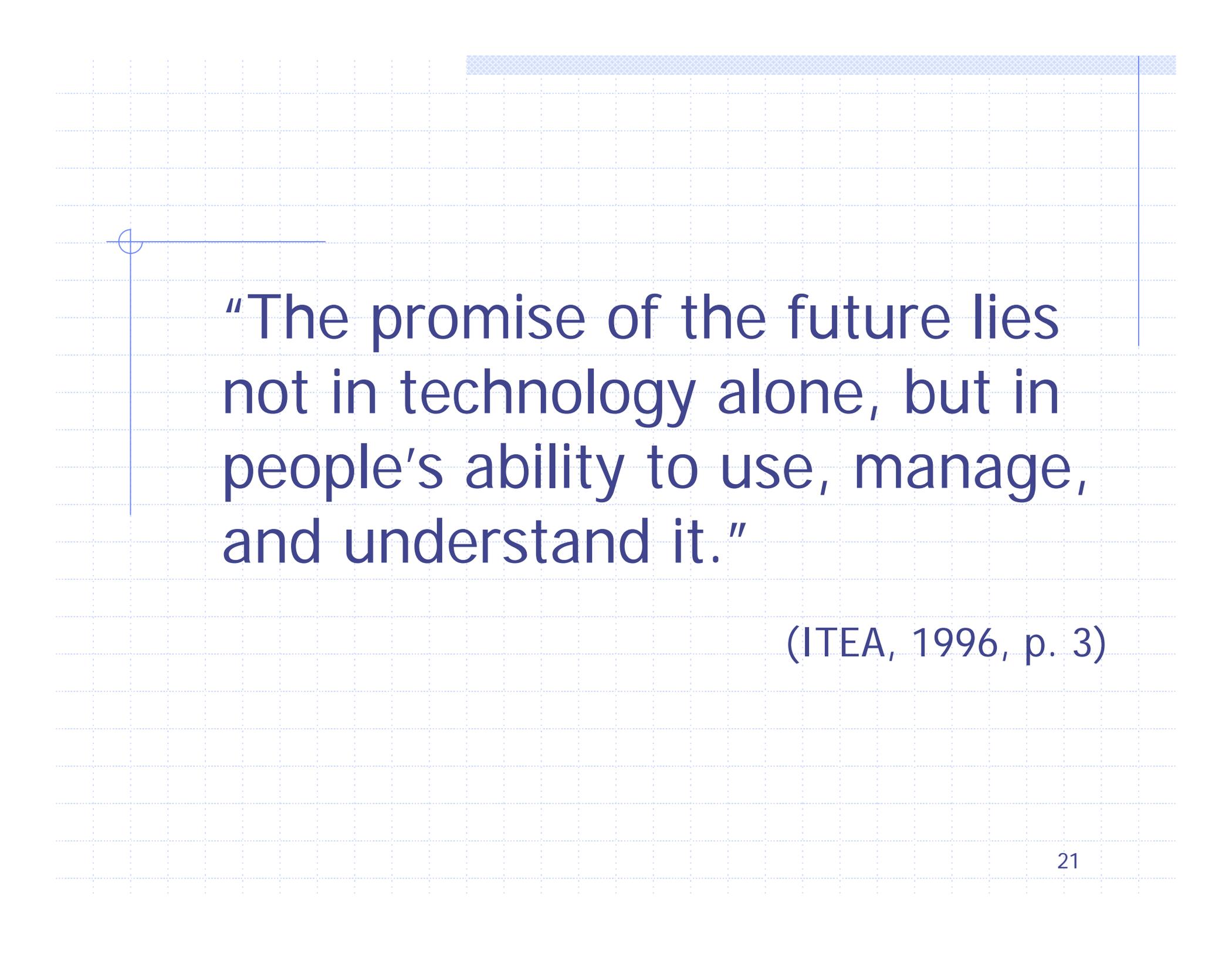
## A Closer Look at the Components

### ◆ Program

Everything that affects student learning, including content, professional development, curricula, instruction, student assessment, and the learning environment implemented across grade levels.

# Putting it all Together

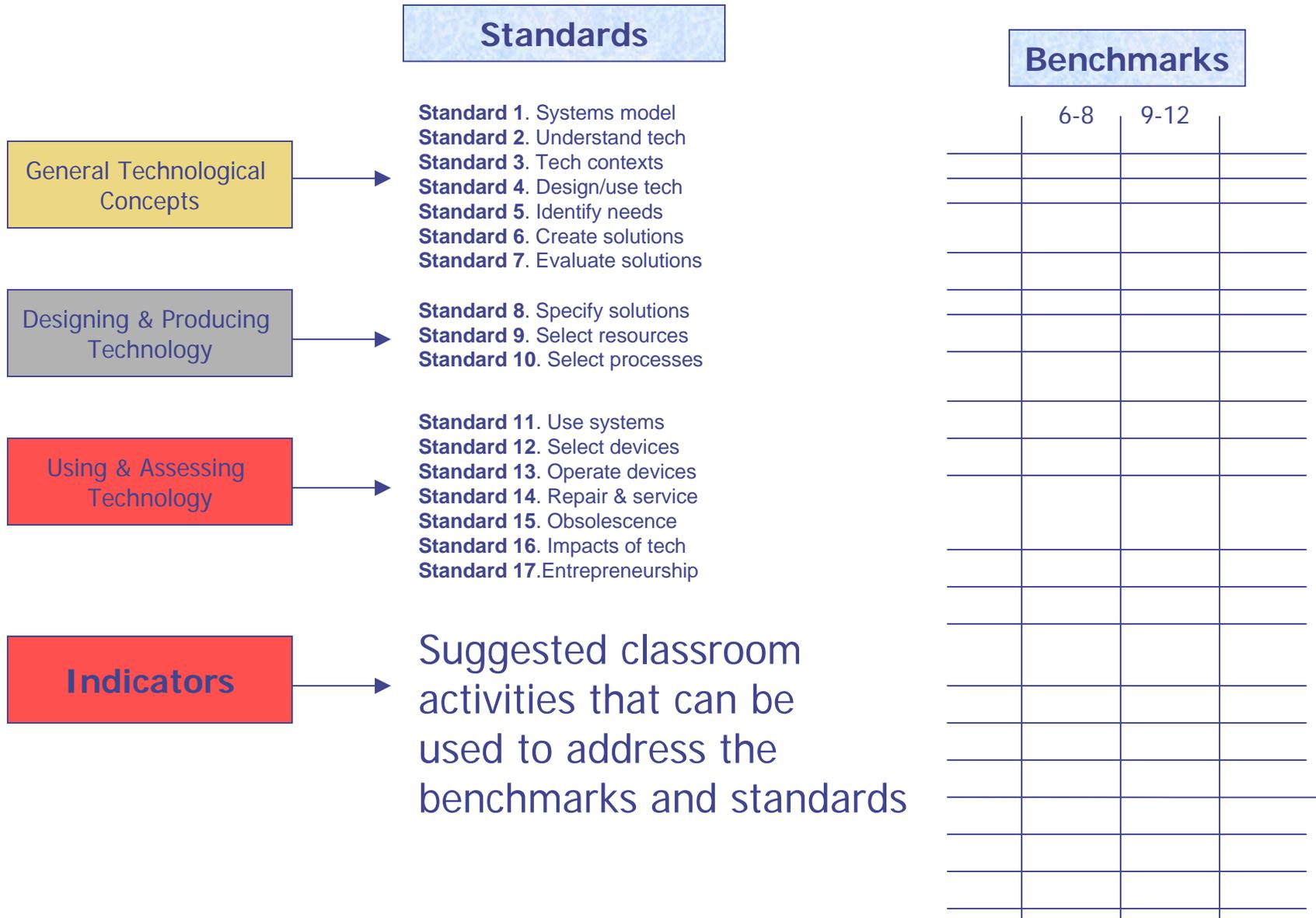




“The promise of the future lies not in technology alone, but in people’s ability to use, manage, and understand it.”

(ITEA, 1996, p. 3)

# Structure of the ISTL Standards



## *The Indiana Standards for Technological Literacy include:*

◆ "Cognitive" Standards: What students should know and understand about technology.

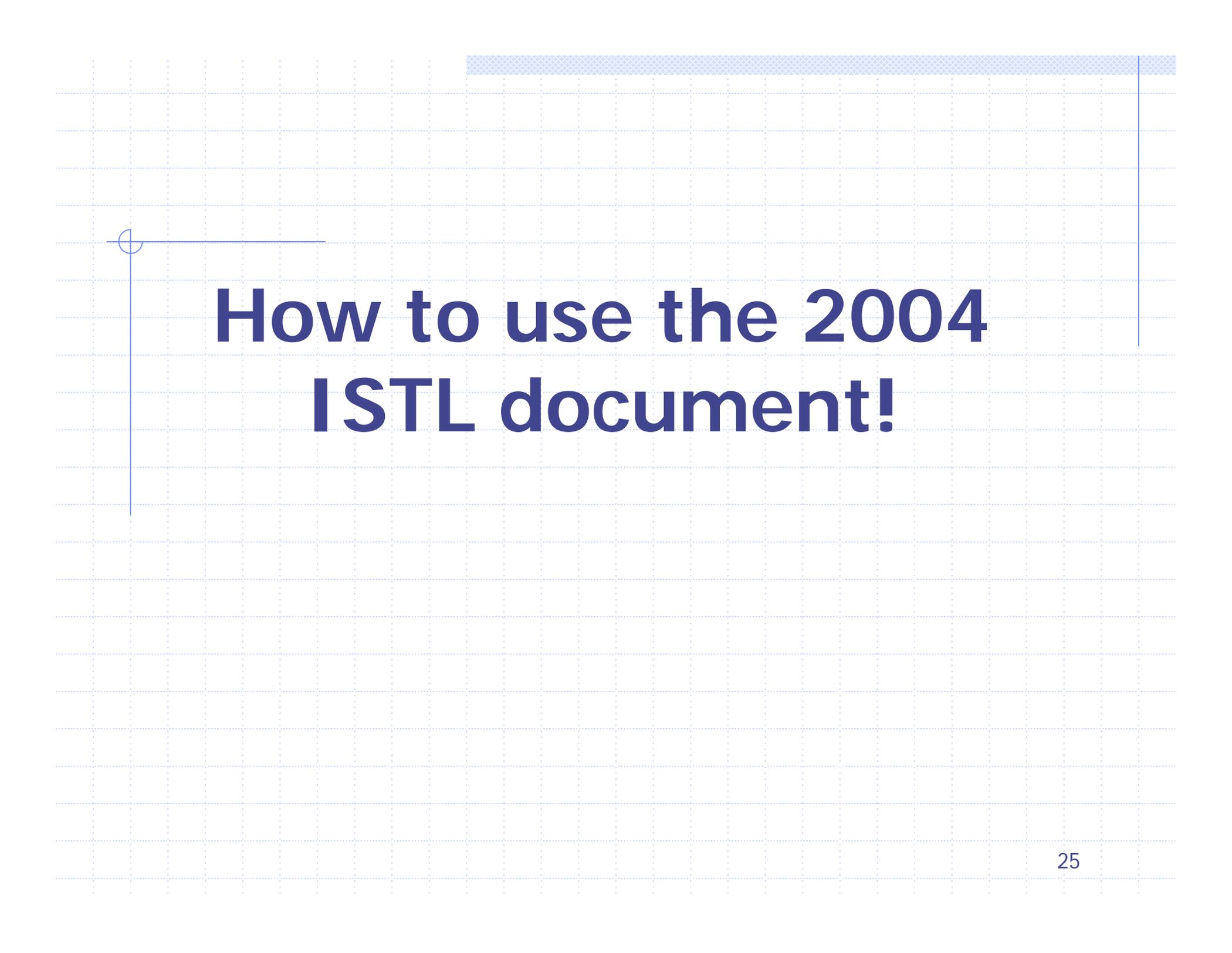
Basic knowledge about technology.

◆ "Process" Standards: What students should be able to do.

The abilities students should possess.

# *ISTL* Benchmarks

- ◆ *Benchmarks* provide the fundamental content elements for the broadly stated standards.
- ◆ The goal is to meet all of the standards through the benchmarks.



# How to use the 2004 ISTL document!

# Standards and Guidelines

- ◆ *Standards* are written statements about what is valued that can be used for making a judgment of quality.
- ◆ Benchmarks are specific requirements or enablers that identify what needs to be done in order to meet a standard.
- ◆ The goal is to meet the standards through the benchmarks.

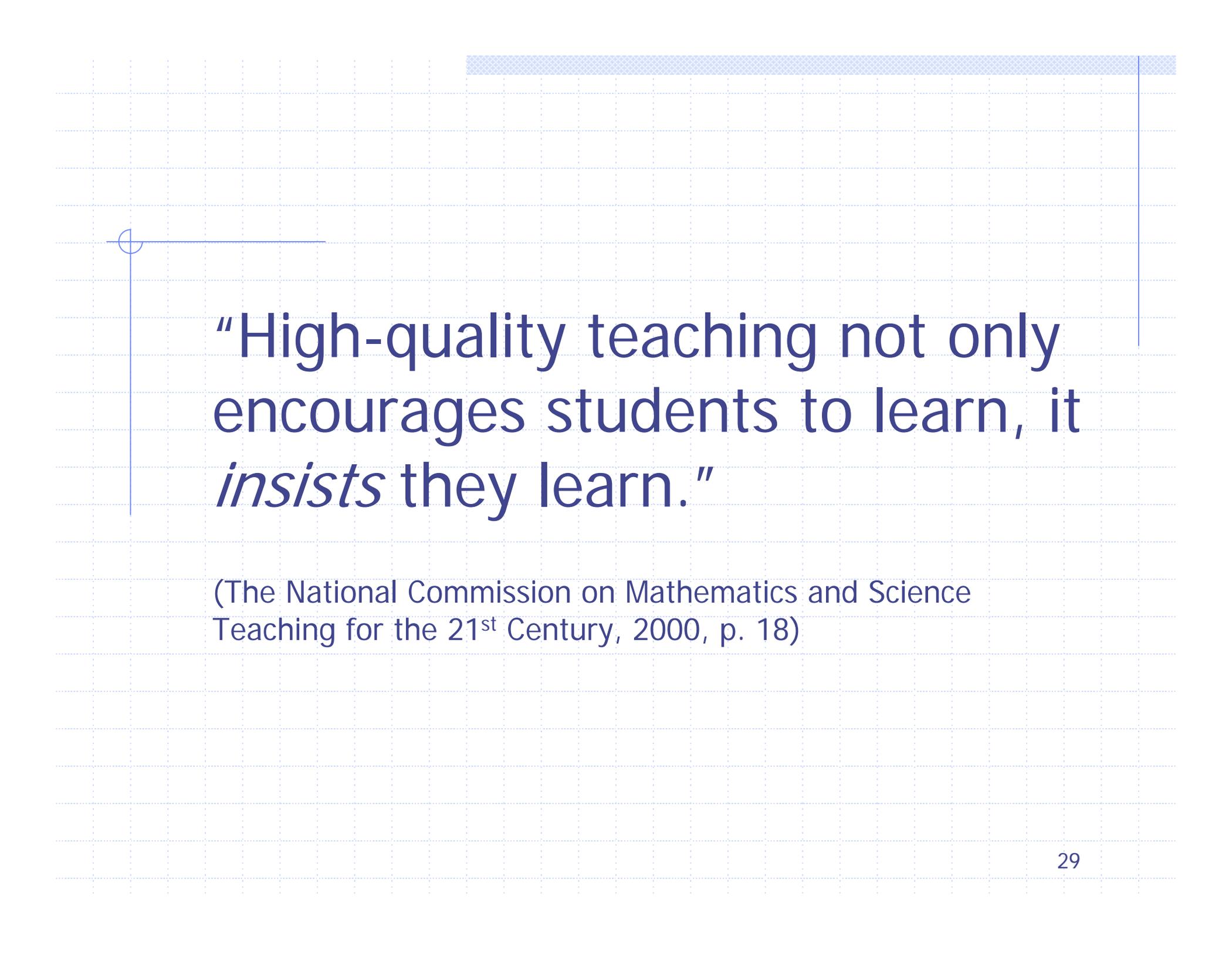
# How are Standards Used in the Classroom?

After reviewing newly developed standards to identify the desired results of your program, you may realize that the **exploration and experience** (the activities) are the *how* of your program and the **Content Standards** are the *what* and the *why*.

# Select Tasks and Activities

## Three Kinds of Learning-Teaching Activities

- **Introductory Activities** - stimulate student interest to participate in the unit of study
- **Enabling Activities** - students learn and demonstrate the knowledge, skills, and habits of mind needed to attain the standards
- **Culminating Activities** - students demonstrate their learning of most or all standards identified



“High-quality teaching not only encourages students to learn, it *insists* they learn.”

(The National Commission on Mathematics and Science Teaching for the 21<sup>st</sup> Century, 2000, p. 18)

# What *Standards for Technological Literacy* are NOT:

- ◆ It is not a curriculum, on the other hand, *Standards for Technological Literacy* can describe overarching goals, or ways in which the curriculum should be orchestrated to achieve a desired result.
  - It is our belief that curriculum goals and principles should not be part of a description of content standards.
- ◆ *Standards for Technological Literacy* does not prescribe courses or programs (groups of courses)

# Content vs. Curriculum

Content standards specify what students should know and be able to do in technology. They indicate the knowledge and processes essential to technology that should be taught and learned in school.

A curriculum specifies the way content is delivered: It includes the structure, organization, balance, and presentation of the ***content*** in the laboratory-classroom from the learner's point of view and the desired achievements.

# Student Performance Standards

- ◆ The degree or quality of proficiency that students are expected to display in relation to the Content Standards.
- ◆ Student Performance Standards answer questions about quality & degree while Content Standards define what students should know & be able to do.

# Example

- ◆ Content Standard: Students will develop an understanding of the characteristics and scope of technology.
- ◆ Performance Standard: Students in K-2 are able to distinguish between the natural world and the human-made world, recognizing the difference between trees, plants, and animals and those that are human designed and made, such as artificial trees and plants.

# Using standards to develop lessons

- ◆ Non-linear process
- ◆ Begin at Different Points
  - Existing units of study
  - Student questions, interests, & concerns
  - Standards from related fields & one or more state frameworks
- ◆ Develop Rubrics and Assessments
- ◆ Check for Understanding
  - What should students come away understanding?
  - What is evidence of that understanding?
  - What activities will develop the understandings?

# Plan Assessment to Reflect Standards

- ◆ Not limited to tests
- ◆ Any method used to gather information about students is assessment
- ◆ Different types of assessment are useful for different types of content
  - “Think like an assessor, not an activity designer.”  
Wiggins & McTighe
  - Sound evidence is valid and reliable, provides user-friendly feedback

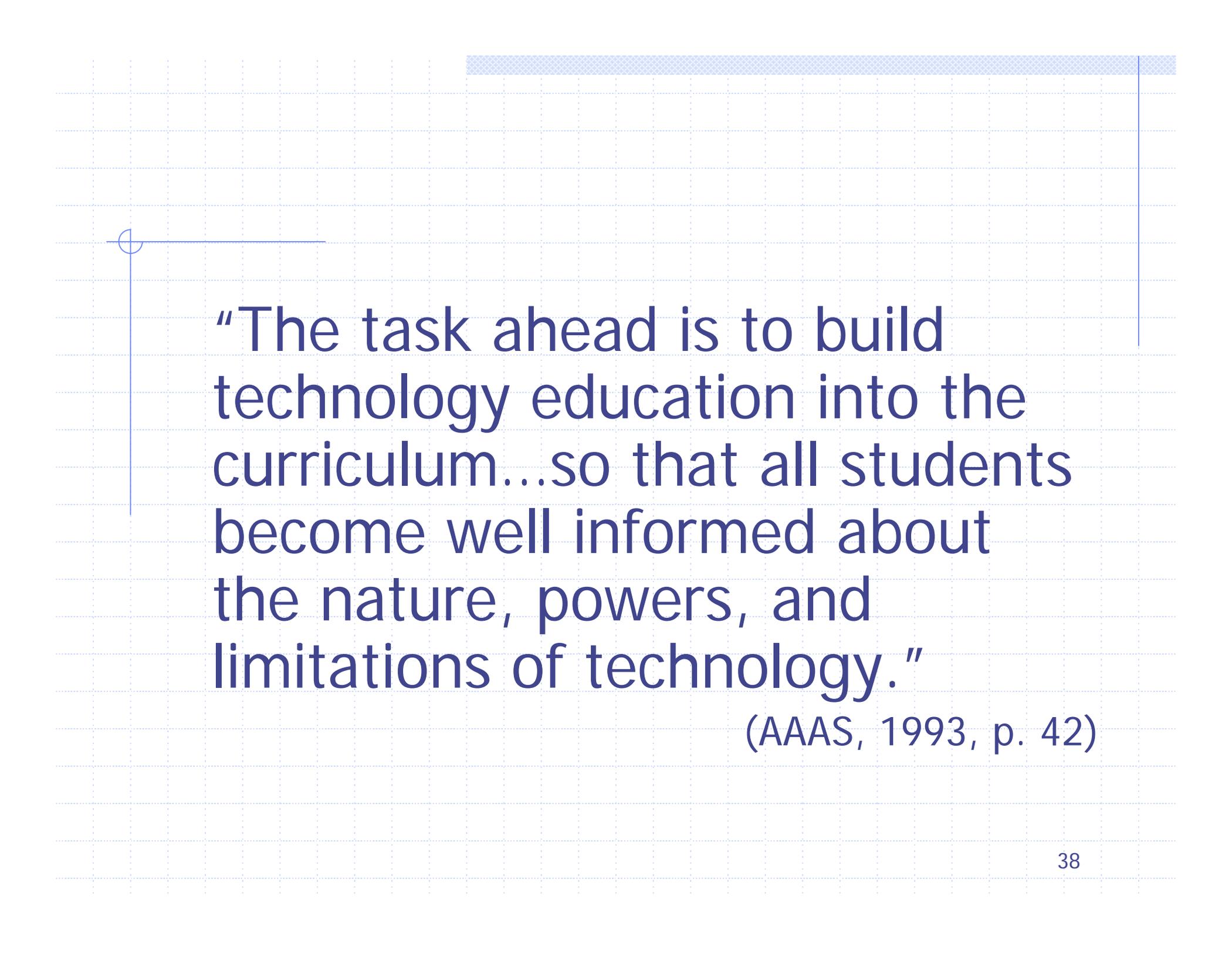
# Questions...

- ◆ Which standard(s) and benchmarks are addressed?
- ◆ What will students understand as a result of this lesson-activity?
- ◆ To what extent does the lesson-activity provide a valid and reliable measure of the targeted standard(s)?
- ◆ Will students be able to revise and refine their work based on feedback?
- ◆ Do you need to
  - Change the activity?
  - Change the product or performance?
  - Reconsider the standard(s)?
  - Consider a combination of factors?

Remember the ***Standards*** are the Target!

# The Challenge...

- ◆ Blending **depth** and **breadth** in a properly balanced ratio
- ◆ Making choices, compromises, and sacrifices
- ◆ Highlighting **Big** ideas
- ◆ Pursuing essential questions in depth
- ◆ Providing as much direct experience as possible to give meaning to key ideas



“The task ahead is to build technology education into the curriculum...so that all students become well informed about the nature, powers, and limitations of technology.”

(AAAS, 1993, p. 42)

# Evaluation of the Workshop

**URL:** <http://www.doe.state.in.us/octe/technologyed/>

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**THANK YOU!**