



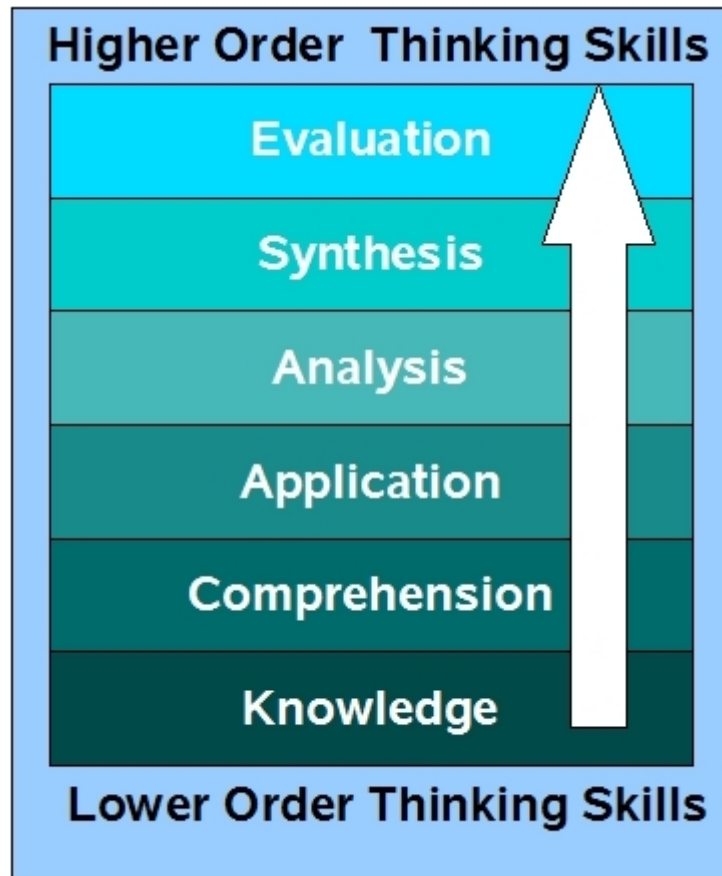
Interpretation of Action Words

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Content

- ◆ Bloom's Taxonomy
- ◆ Action Words used in C & A Guide

Bloom's Taxonomy



- ◆ **Benjamin S. Bloom(1956, Jewish-American)**
- ◆ Cognitive Domain at the beginning
- ◆ Bloom said: Ideally each major field should have its own taxonomy in its own language - more detailed.

Application

TO USE INFORMATION

try, diagram, perform, make a chart, put into action, build, report, employ, relate, draw, construct, adapt

Comprehension

TO UNDERSTAND INFORMATION

summarize, relate, experiment, simple comparisons, demonstrate, explain, reword, discuss

Knowledge

TO FIND OR REMEMBER INFORMATION

tell, uncover, show, list, locate, repeat, define, explain, investigate, recall, name, point to

Evaluation

interpret, justify, decide,
criticize, judge, solve, rate,
assess, appraise

TO MAKE JUDGEMENTS ABOUT KNOWLEDGE

Synthesis

hypothesize, predict, create,
invent, produce, modify,
extend, design, formulate,
develop, build, compile

TO CREATE NEW IDEAS OR THINGS

Analysis

study, combine, separate,
categorize, detect, examine,
inspect, discriminate, take
apart, generalize, compare,
analyze, scrutinize

TO TAKE INFORMATION APART

Action words were used in C & A guide

"Students should be able to..."

Students should learn:

Students should be able to:

a. Temperature, heat and internal energy

temperature and thermometers

- realise temperature as the degree of hotness of an object
- interpret temperature as a quantity associated with the average kinetic energy due to the random motion of molecules in a system
- explain the use of temperature-dependent properties in measuring temperature
- define and use degree Celsius as a unit of temperature

Some “action words” related to experiment

Domain	Action verbs used	Explanation on using in C & A guide
Knowledge (1)	Detect	Notice and know that it is being there
	Examine	Inspect experimentally closely
Application (3)	Determine	Find out the answer, results, factors or relationship
	Measure	
Synthesis(5)	Verify	Check that it is true by investigation

Cognitive Domain (1 - 2)

Knowledge	<ul style="list-style-type: none">• State• Define• Point out(1) – <i>light as an example of transverse wave</i>• Realise• Understand• Describe
Comprehensive	<ul style="list-style-type: none">• Use – <i>XX as unit of YY</i>• Distinguish• Identify

Cognitive Domain (3)

Application

- Construct(2) – *image*
- Present(5) – *information on displacement-time graph for travelling waves*
- Draw(diagram)(2) – *wavefront diagram*
- Apply (equation) and solve (related problem)
- Estimate(3)
- Find(the sum)(1) and resolve(1) – *forces in 2D*

Cognitive Domain (4)

Analysis

- Sketch
- Represent – *an electric field using field lines*, equation ($F = qvB$, exponential decay)
- Relate – logically,
- Explain – reason,
- Interpret – *gas expansion in terms of molecular motion, force as the rate of change of momentum*
- Compare – *the general properties of sound waves and those of light waves*

Cognitive Domain (5 - 6)

Synthesis

- Derive(equation) – *combination of resistances in series and parallel, Hall voltage*
- Combine(1) – *general gas law*

Evaluation

- Discuss – *the occurrence and practical uses of eddy currents*
- Give(example)
- Suggest(1) – *their own methods for improving the accuracy of experiments...*

Example 1

wave nature of light

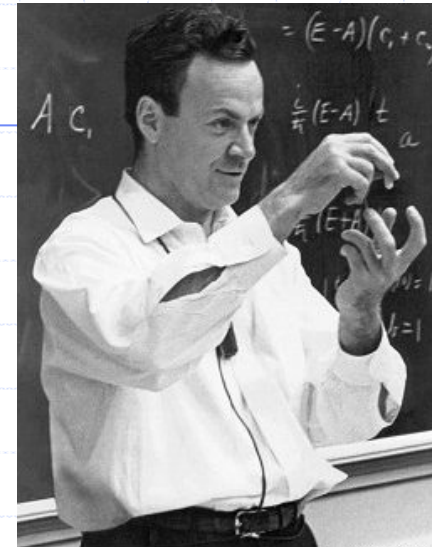
- point out light as an example of transverse wave
- realise diffraction and interference as evidences for the wave nature of light
- examine the interference patterns in the Young's double slit experiment
- apply $\Delta y = \frac{\lambda D}{a}$ to solve problems
- examine the interference patterns in the plane transmission grating
- apply $d \sin \theta = n \lambda$ to solve problems

Example 2

moment of a force

- define moment of a force as the product of the force and its perpendicular distance from the pivot
- discuss the uses of torques and couples
- state the conditions for equilibrium of forces acting on a rigid body and solve problems involving a fixed pivot
- interpret the centre of gravity and determine it experimentally

The End



"... the best teaching can be done only when there is a direct individual relationship between a student and a good teacher -- a situation in which the student discusses the ideas, thinks about the things, and talks about the things."

Richard P. Feynman