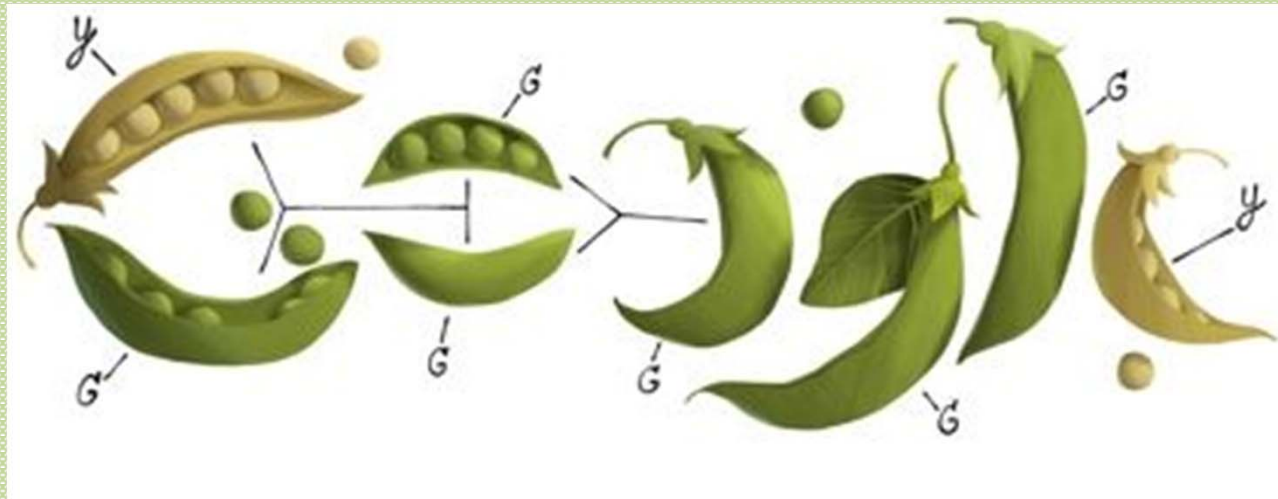


Thursday – 21 July 2011

Today's schedule

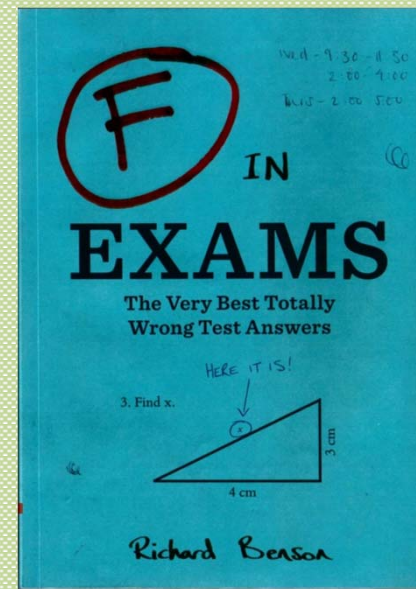
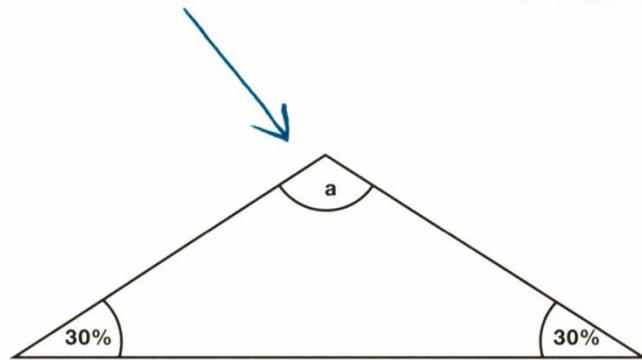
| | |
|-----------------|--|
| 8:30 – 10:00 am | Introductory session – our first science experiment?... “Eggs – the beginning of life...” – example lesson - letting the students develop their investigation Break |
| 10:10 – Noon | Continuing our module development Developing our third set of modeling modules |
| Noon - 12:30 | Lunch |
| 12:30 – 2:30 pm | Completing the third/fourth/fifth...module sets – written documents |
| 1:00 – 1:20 pm | Christine presents bouillon cube experiment results |
| 2:30 – 3:15 pm | Whiteboard presentations |
| 3:20 - 3:30 pm | A little homework, reflections! |
| Tomorrow | Discussion about our progress; Overview as we see it – the story of a modeling biology curriculum |



A representation for Mendel....

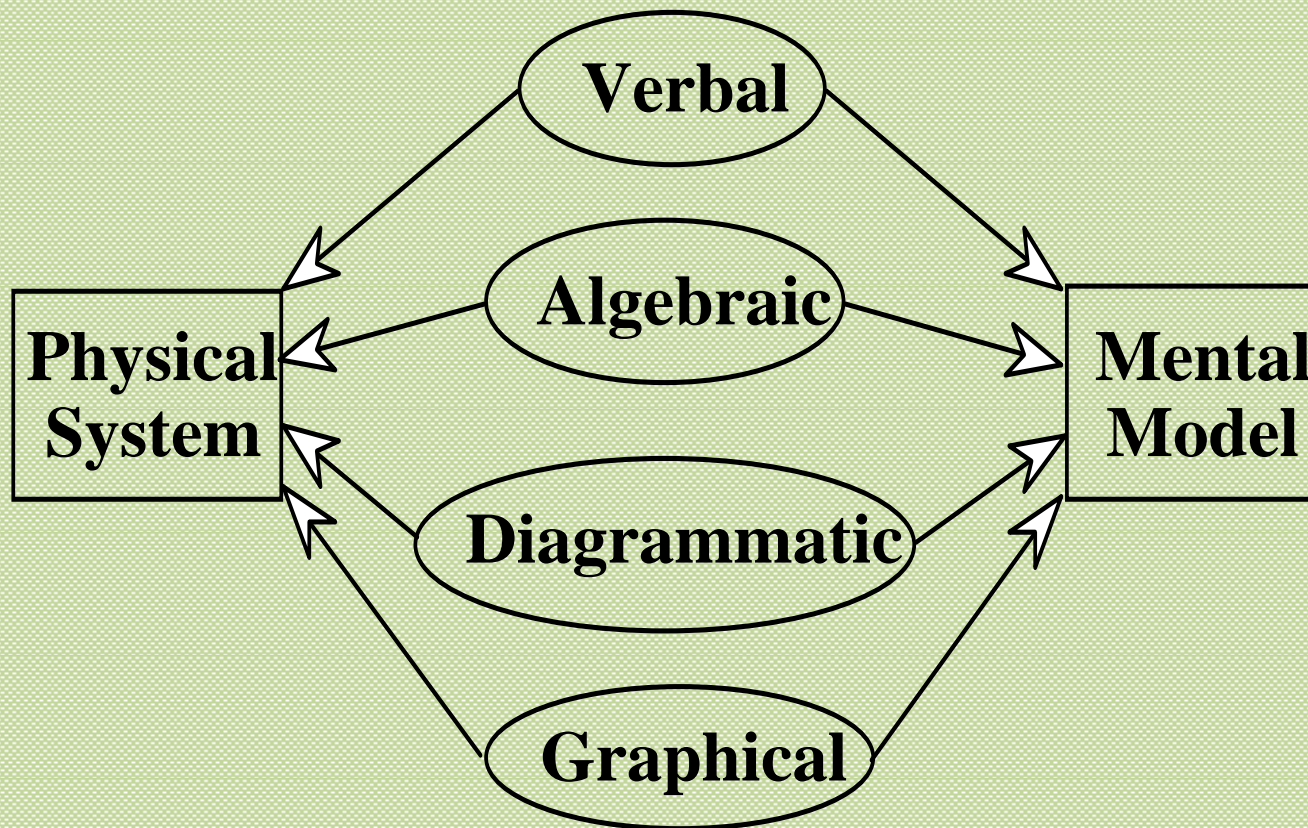
Find the angles marked with letters.

THIS IS THE ANGLE MARKED WITH A LETTER



Modeling – an example

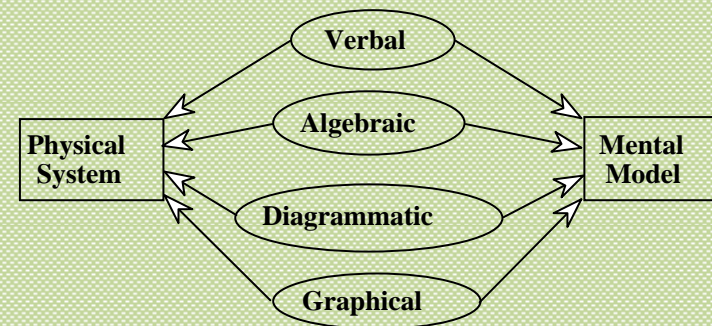
Symbolic Representations



Modeling – one object – 2 examples

EGGS – the beginning of life?
WHY?

Symbolic Representations



Example A :

Leading Question:

Why are Eggs egg-shaped?

Example B : The Energy processes/changes taking place during an egg drop

Leading Question:

What energy changes take place when you drop an egg?

(**Bonus question:** some of these eggs have been boiled – has yours been boiled? – Does it make a difference?)

INVESTIGATE...

Develop 3-4 **representations** of your investigation

Why are eggs egg-shaped?

This question seems like a tough one to crack, but scientists have one very sensible theory: the ovoid shape gives an egg its incredible strength! You can see this amazing power firsthand with a simple experiment.

First, remove any rings on your fingers and slip on a rubber glove. Then wrap your fingers around an egg and squeeze really, really hard while trying to apply equal pressure to all sides of the egg. If this demonstration is done correctly, even Arnold Schwarzenegger couldn't crack it. Why? Because of something the egg has in common with famous works of architecture like the Pantheon in Rome, Italy.

This monument has survived for nearly 2,000 years because it's shaped like a three-dimensional arch, a domed, egg-like shape that's one of the strongest architectural designs in the world. When an object is placed on top of it, no single point in the dome supports the entire weight; instead, the object's heaviness is carried down along the curved walls to the dome's wide base. This, of course, works best when you apply similar pressure to all sides of the dome. If your egg breaks, it's most likely because one of your fingers applied greater pressure to the shell than the others.

Many scientists also believe that the egg is shaped the way it is because this enables it to roll in a circular path along its most pointed end (which really comes in handy for birds laying eggs in high places; there's far less danger of the egg rolling out of its nest). Additionally, the ovoid shape is probably a lot more comfortable for a bird to lay than, say, a sphere or a cylinder.

But whatever the reasons for an egg's shape, we can all be grateful for it--I mean, how else would it fit into egg cups and containers in our refrigerator doors?

The Biology modeling curriculum story and the Standards

The Set-up from workshop 1a

MACRO:

| | |
|---------------------------------|--------------------|
| Evolution-Macro: | Standards: B.8.... |
| Interdependence: | Standards: B.4... |
| Matter, Cycles, Energy Transfer | Standards: B.3.. |

MICRO:

| | |
|--|--------------------------|
| Genetics-Microevolution | Standards: B.7..., B.8.. |
| Molecular Basis of Heredity-Microevolution | Standards: B.8... |
| Cellular Reproduction | Standards: B.6... |
| Cellular Structure-Microevolution | Standards: B.5.. B.6.... |
| Matter, Cycles, and Energy Transfer: Micro | Standards: B.4... |
| Cellular Chemistry | Standards: B.2..... |

Questions: Does this development make sense?
What is the ordering of curriculum?
The story development? (Story threads?)
Which parts are done? Which parts are needed?
Consistency?

Today:

Preliminary discussion;
Putting all the modules
(from the 2 workshops)
into place....

Tomorrow:

the “modeling in the modules”

Goals for this workshop

- Develop a set of modules for teaching first year biology using the modeling format
- These modules/investigations will address specific (identified) Indiana Biology Standards
- Write descriptions of these investigations so that
 1. They are understandable to other modeling teachers – to the **“Biology Modeling Community”**
 2. They are in a consistent format.
 3. *Ensure that the completed lesson descriptions tell a **consistent biology story (the modeling format)** consistent with the story of the standards*