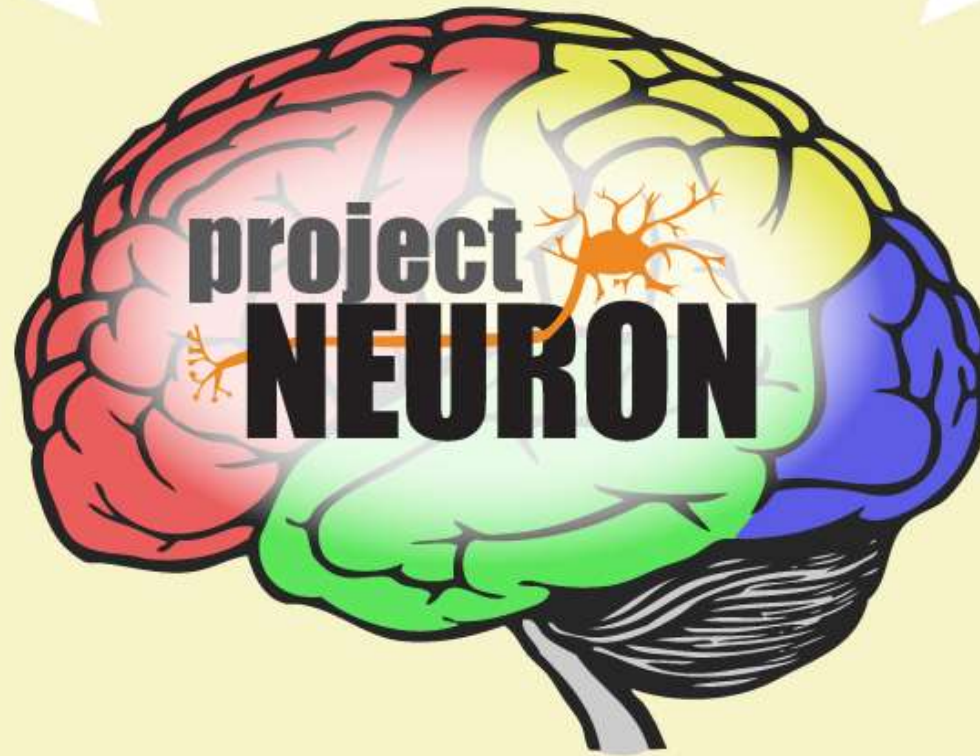


From Memorization to Modeling: Reconceptualizing Teaching About Cellular Division



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SEPA SCIENCE EDUCATION
PARTNERSHIP AWARD
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Think, Group, Share

- What activities have you used to teach about cell division?
- What class(es) and grade level(s) have you used them in?

Goals for Session

- Create and revise a diagram model of cellular division
- Analyze student work from the activity
- Increase familiarity with
 - Unit storylines
 - Assessment boundaries
 - Evidence statements

Mini Case A

- What issues came up in Case A?
- How do those issues relate to your experiences?
- What are science unit storylines?

Project NEURON Curriculum Units

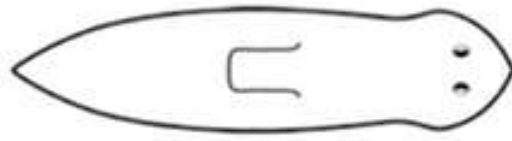
- **Do you see what I see?**
 - *Light, sight, and natural selection*
- **What can I learn from worms?**
 - *Regeneration, stem cells, and models*
- **What makes me tick...tock?**
 - *Circadian rhythms, genetics, and health*
- **What changes our minds?**
 - *Toxicants, exposure, and the environment*
 - *Foods, drugs, and the brain*
- **Why dread a bump on the head?**
 - *The neuroscience of traumatic brain injury (TBI)*
- **Food for thought: What fuels us?**
 - *Glucose, the endocrine system, and health*
- **What makes honey bees work together?**
 - *How genes and environment affect behavior*
- **How do small things make a big difference?**
 - *Microbes, ecology, and the tree of life*

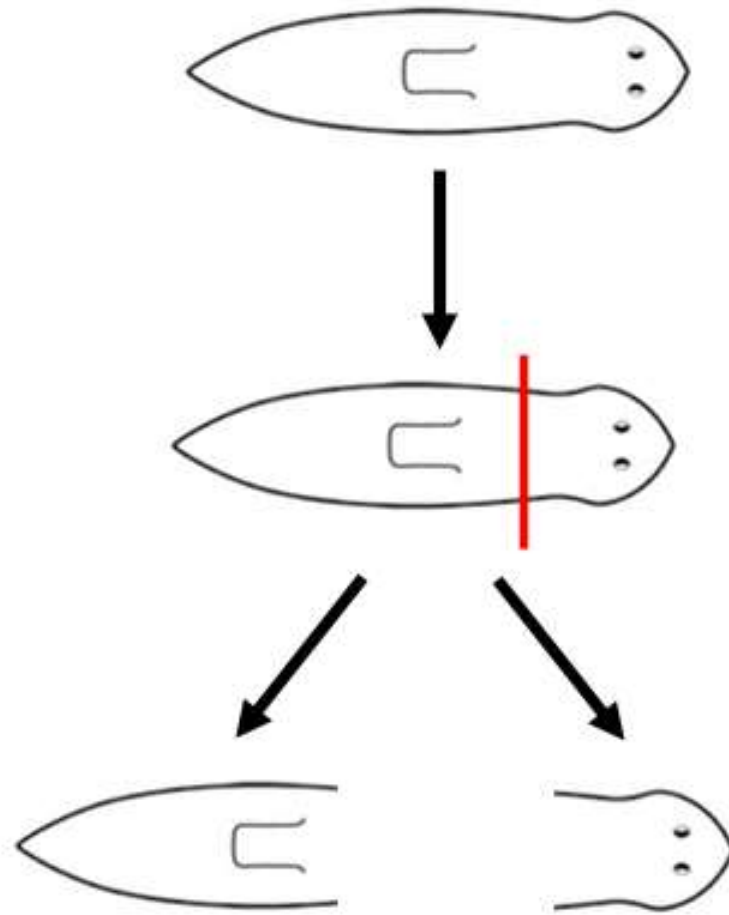
Available for FREE at:
<http://neuron.illinois.edu>

Unit Storylines

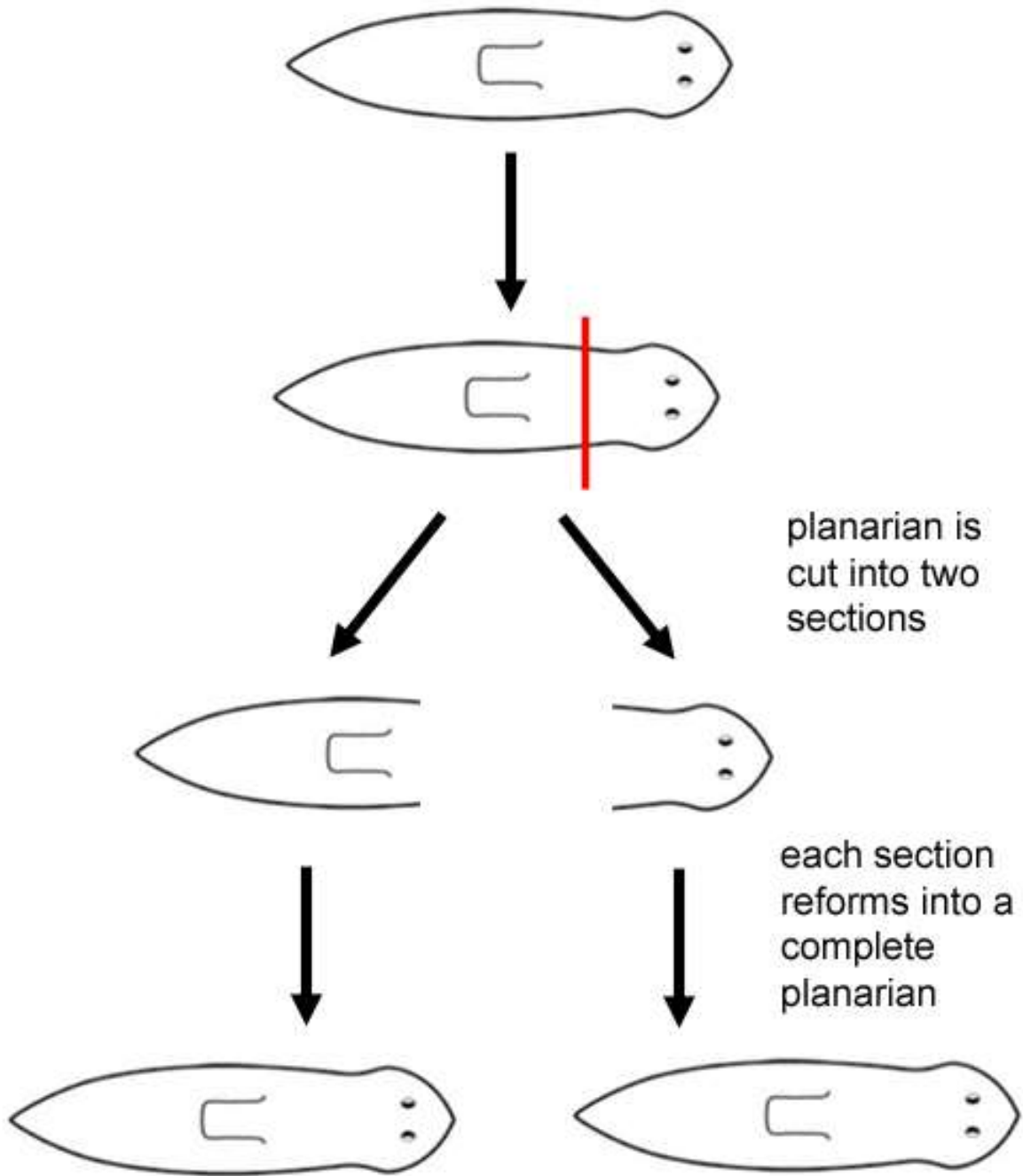
- Intentional sequence of lessons that help students connect science content with the activities that they do







planarian is
cut into two
sections



What can I learn from worms?

1. What is regeneration?
2. How do planarians react to their environment?
3. How do planarians regenerate?
4. What happens in the worms' cells during regeneration?
5. How can we see the worms' cells during regeneration?
6. How do DNA and protein determine behavior?
7. What does planarian regeneration tell us about human regeneration?

Mini Case B

- What issues came up in Case B?
- How do those issues relate to your experiences?
- What are assessment boundaries?

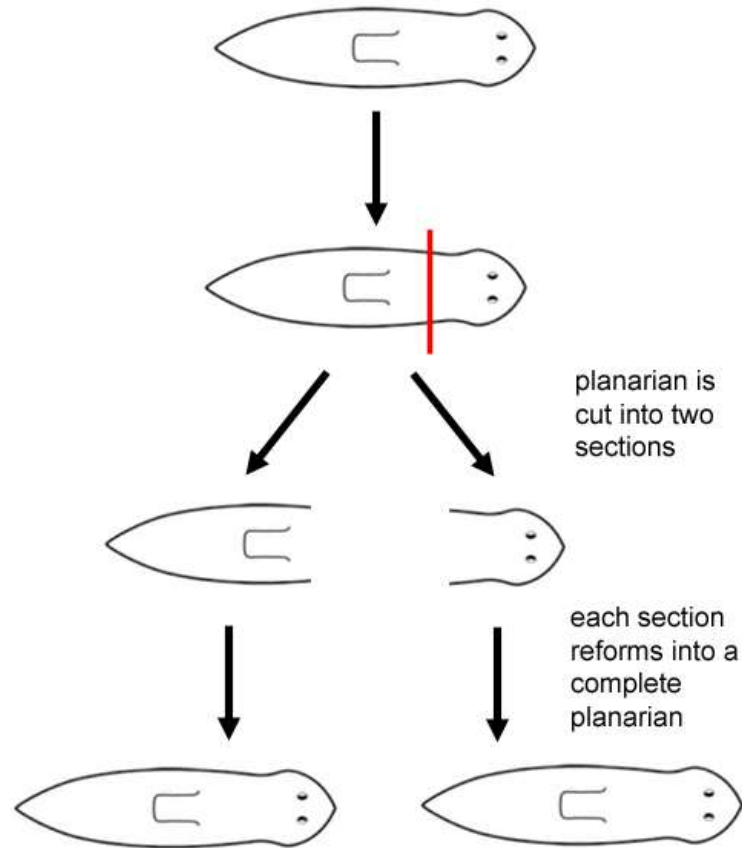
Assessment Boundaries

- “Specify limits to large-scale assessment. They are not meant to put limits on what can be taught or how it is taught, but to provide guidance to assessment developers.”

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms. *[Assessment Boundary: Assessment does not include specific gene control mechanisms or rote memorization of the steps of mitosis.]*

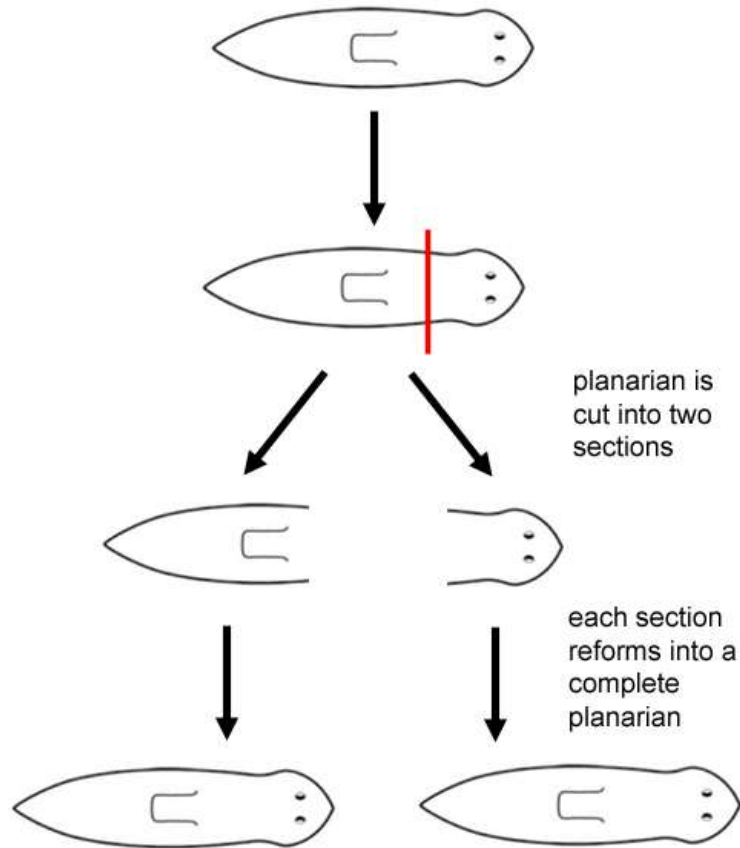
Create Initial Model

- How do planarians regenerate?



Revise Model

- How do planarians regenerate?



Mini Case C

- What issues came up in Case C?
- How do those issues relate to your experiences?
- What are evidence statements?

Evidence Statements

- “NGSS Evidence Statements provide educators with additional detail on what students should know and be able to do. These are statements of observable and measurable components that, if met, will satisfy NGSS performance expectations.”

Analyze Student Work

- What changes have students made to their revised models?
- What items on the checklists are included?
- What parts of the evidence statements are represented?

Connecting to Your Classroom

- How would you use the modeling activity with your students?
- What changes would you make to the activity and materials?

Goals for Session

- Create and revise a diagram model of cellular division
- Analyze student work from the activity
- Increase familiarity with
 - Unit storylines
 - Assessment boundaries
 - Evidence statements

Acknowledgements

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- University of Illinois

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Project NEURON

Novel Education for Understanding Research on Neuroscience

Find out more about our 2013 Summer Professional Development!

Project NEURON brings cutting-edge neuroscience to middle and high school students through classroom modules and activities based on research conducted at the University of Illinois at Urbana-Champaign. We bring together scientists, science educators, schoolteachers, and students to develop and disseminate materials that connect science with national and state science standards.

Our core project is the development of in-class [curriculum units](#) that emphasizing inquiry and active learning. These materials are tested by a dedicated group of high school teachers, to whom we provide support and [professional development](#). We have adapted and expanded these materials into a variety of [additional projects](#) that include outreach for younger grades, informal education, and [educational games and videos](#).

Please note that we are continuously improving this website and the materials hosted here. We work hard to create quality materials, but if you notice any inconsistencies, missing materials, etc., please [let us know!](#) We also love to hear suggested improvements or adaptations from teachers who have used our materials!

News and Events

[Color Sorting Activity in The Science Teacher](#)
March 13, 2013
The March 2013 issue of *The Science Teacher* features the colored candy sorting activity in an article titled, "What color do you see?" (p. 62-65).

[Color Sorting Game is Back Online](#)
February 20, 2013
The *Color Sorting Game* is back up on the Project NEURON web site.

[Project NEURON at 2013 Public Engagement Symposium](#)
February 6, 2013
Keep an eye out for a poster at the 2013 Public Engagement Symposium that describes FIND Orphy.

Neuroscience Day

Neuroscience Day

March 19 @ Marina Inn
S. SIOUX CITY, NE

March 20 @ Siente Gleska
MISSION, SD

9:00 - 3:00 with lunch provided

