Carolina Biological Supply Company
Next Generation Dissection

#carolinaNSTA
Wear Your Tee and Enter to Win a **FREE** Kit of **YOUR** Choice!

• To be eligible, you MUST wear your “Perfect” T-shirt to the Carolina booth.

• Turn in your completed entry form to a staff member from **PRESERVED MATERIALS**.

• One winner will be chosen after the show. (You need not be present to win.)
Objectives

• Introduce basic dissection techniques
• Explore the internal and external anatomy of the frog
• Discuss and practice integrating the 3-dimensions during dissection
  • Phenomena
  • Relate structure to function
  • Talk about adaptations
  • Discuss modeling
• Experience the quality of Carolina’s Perfect Solution® specimens
Carolina’s Perfect Solution® Specimens

Quality
- Superior preservation
- Superior tissue color and texture

Safety
- No dangerous off-gassing
- No formalin odor
## Correlation to Next Generation Science Standards* (NGSS)

### Performance Expectations

- **MS-LS1-3**: Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- **HS-LS-2**: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

### Science and Engineering Practices

<table>
<thead>
<tr>
<th>Developing and Using Models</th>
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<tbody>
<tr>
<td>- Develop &amp; use a model to describe phenomena.</td>
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<tr>
<td>- Develop &amp; use a model to illustrate relationships between systems and components.</td>
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### Disciplinary Core Ideas

<table>
<thead>
<tr>
<th>LS1 A: Structure and Function</th>
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<tr>
<td>- Multicellular organisms have a hierarchical structure with multiple parts.</td>
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<th>LS4 C: Adaptations</th>
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<tr>
<td>- Traits that support survival and reproduction persist.</td>
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### Crosscutting Concepts

<table>
<thead>
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<th>Structure and Function</th>
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<tr>
<td>- The functions and properties of objects can be inferred from their structure.</td>
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Start with a Phenomenon
Prelab Modeling

In your classroom, have students construct a physical model of the frog’s digestive system using only their prior knowledge.

Provide common materials such as paper towels, balloons, socks, etc.
Dissection Preparation Tips

- **Organize your dissection area:**
  - Take out your dissection tray
  - Lay out your instruments
    - Scissors
    - Probe

- **Use appropriate personal protective equipment:**
  - Apron
  - Gloves
  - Goggles
Carolina® Dissection Mats

- Clear, concise dissection instructions
- Detailed color photographs
- Labeled internal and external structures with definitions
- Cost-effective
- Reusable—wipe clean
Safety Issues

- **Personal Protective Equipment**
  Gloves, goggles, and lab aprons

- **Dissection Tools**
  Be diligent with sharp tools

- **Safety Tip**
  If you are not using an instrument, set it down
1. At the anterior of the specimen, locate an area where there is excess plastic.

2. Force any fluid out of the area to prevent spills.

3. Cut a small hole in the excess plastic. This will allow the fluid to drain to the bottom of the bag.

4. Continue to cut around the anterior of the specimen until you can easily remove the specimen from bag.

5. Keep bag upright until we collect fluid and bag.
Frog External Anatomy

Eye (with nictitating membrane)

External Nares

Tympanic Membrane

Note coloration differences on the dorsal and ventral surfaces.

What are some adaptation you observe?
Open Wide!

Cut through the jaw joints with your scissors.

Examine the internal structures of the mouth.
Open Wide!

How do the *structures* of the mouth *function* in food capture and ingestion?
Love the Skin You’re In!

[Image of a frog being cut open with a diagram overlay]
Pull back the flaps of skin.

Make cuts through the muscle using the same pattern.
Internal Anatomy

Liver

Heart

Fat Bodies

Stomach

Small Intestine

Oviducts
Internal Anatomy - Male

- Small Intestine
- Fat Bodies
- Kidney
- Testes
- Large Intestine
- Urinary Bladder
Remove the small and large intestine.

Carefully cut the mesentery holding the small intestine together and stretch it out.

Why is the small intestine so much longer than the large intestine?
Assessment

• Have students describe how the function of other organs they observe during the dissection are related to their function (i.e., fat bodies, stomach).

• Revisit and modify the prelab model of the frog digestive system based on evidence gathered during the dissection.

• Dissect another vertebrate and discuss homologous structures.

• Provide the function and have students fill in the corresponding structure or vice versa (next slide).
<table>
<thead>
<tr>
<th>Function</th>
<th>Structure</th>
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<tbody>
<tr>
<td>Support</td>
<td>Vertebral column</td>
</tr>
<tr>
<td>Camouflage</td>
<td>Difference in dorsal and ventral pigmentation</td>
</tr>
<tr>
<td>Movement</td>
<td>Muscular hind legs for jumping and swimming</td>
</tr>
<tr>
<td>Catching Prey</td>
<td>Forked, muscular tongue attached at front</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Tongue attached at front; 2 types of teeth</td>
</tr>
<tr>
<td>Circulation</td>
<td>One 3-chambered heart</td>
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Can you think of more?
Cleanup Instructions

- KEEP GLOVES ON!
- Place ONLY animal waste in buckets.
- All other trash goes in trash bags.
- Clean tools and wipe off tables.
Dissection and NGSS Resources

For FREE resources check out www.carolina.com/teachdissection

Webinars

Articles

Kits
We Can Meet Your Dissection Needs

Top-quality specimens and supplies
Carolina Offers Free Resources to Support Teachers

http://knowledge.carolina.com
Evaluations: Share Your Thoughts

We are striving to make our workshops great!

Please evaluate this session and presenter on a scale from 0 to 10 (10 = best).
Please help us reset the room by gathering your belongings and exiting between sessions.

THANK YOU!