



# **BioTechBuilder**

**CAREER & TECHNICAL EDUCATION**

## **Buyer's Guide | 2025-2026**

**Supply Lists and Recommendations for Laboratory Equipment**






# BioTechBuilder

## CAREER & TECHNICAL EDUCATION

### Resources for Buyers







- [Carolina BioTechBuilder Knowledge Center](#)
- [BioTechBuilder Educator Training Series](#)
- [Interactive BioTechBuilder Cost Calculator](#)
- [Carolina Kit Material Lists](#) \*Update by Carolina in progress\*
- [Needed-but-not-included Materials](#) \*Update by Carolina in progress\*

### Modules and Topics

<p>Lab Skills</p>  <p>Introduces essential lab concepts and techniques.</p>	<h2>Module 1: Lab Skills</h2> <hr/> <p>Introduces essential lab concepts and techniques</p> <ul style="list-style-type: none"><li>• <b>Topic 1: Building a Solid Foundation</b></li><li>• <b>Topic 2: Making Solutions</b></li><li>• <b>Topic 3: Growing Cells</b></li></ul>
<p>Foundations</p>  <p>Introduces DNA and protein analysis techniques.</p>	<h2>Module 2: Foundations</h2> <hr/> <p>Uses a molecular framework to introduce techniques in DNA and protein analysis</p> <ul style="list-style-type: none"><li>• <b>Topic 4: Analyzing DNA</b></li><li>• <b>Topic 5: Analyzing Proteins</b></li></ul>
<p>Applications</p>  <p>Introduces industrial biotech applications and commercialization practices.</p>	<h2>Module 3: Applications</h2> <hr/> <p>Introduces industrial biotech applications and commercialization practices</p> <ul style="list-style-type: none"><li>• <b>Topic 6: Biomanufacturing</b></li><li>• <b>Topic 7: Synthetic Biology</b></li></ul>



### FOR USE WITH INTERACTIVE BIOTECHBUILDER COST CALCULATOR

<p><b>SAFETY</b></p>  <p><a href="#">Check out Carolina's PPE Buying Guide</a></p>	<p><b>PPE:</b> We highly recommend gloves (non-latex), eye protection, and lab coats (can be disposable) for students. Heat resistant gloves required for Topics 2, 3, 4, and 7.</p> <p><b>Decontamination:</b> Labs will need bleach and spray bottles with ethanol (or other disinfectant spray) for decontamination.</p> <p><b>Clean Up:</b> Having paper towels, a brush, and a dustpan on hand will keep the lab ready to go. A container for broken glass is also a good idea.</p>
<p><b>PIPETTES</b></p>  <p><a href="#">Which micropipette is right for me?</a></p>	<p><b>Micropipettes:</b> We recommend that each pair of students, or at a minimum each group of 4 students, have their own set of micropipettes (P20, P200, P1000) and tip boxes ("yellow" and "blue").</p> <p><b>Pipette Aids:</b> These bulbs or aids are for use with serological pipettes</p>
<p><b>TEMPERATURE</b></p>  <p><a href="#">You can look for refurbished equipment!</a></p>	<p><b>Cold Storage:</b> Any fridge will work (even a 3.2 cubic foot dorm fridge without a freezer), a standard -20 °C freezer (or a fridge/freezer unit), and insulated ice buckets (you can get away with 4-6 for Topic 3, but we recommend 12 for Topics 4-5 which involve more tubes)</p> <p><b>Incubation:</b> Incubator (needs 2 temperatures for Module 3; not concurrent), shaking incubator (turn off shaking to use as a non-shaking incubator), heat block or water bath (with tube float rack), hot plate with magnetic stirrer and stir bars</p>
<p><b>GLASSWARE</b></p>  <p><a href="#">Learn which materials can be heated!</a></p>	<p><b>Beakers:</b> Sizes 50ml, 100ml, 250ml, and 600 ml</p> <p><b>Erlenmeyer flasks:</b> Assorted sizes 125-250ml</p> <p><b>Graduated cylinders:</b> 100ml, 500ml, and assorted</p> <p><b>Storage bottles:</b> 500ml</p>
<p><b>EQUIPMENT</b></p>  <p><a href="#">See Carolina's Biotech Equipment Guide</a></p>	<p><b>Benchtop Equipment:</b> Electronic balance (0.01g precision), thermocycler, spectrophotometer (can use a plastic chamber and smart phone app), laboratory vortex, microcentrifuge (for Module 2 and beyond, minimum 13k rpm required), rocker/shaker</p> <p><b>Probes:</b> Thermometers, pH probes</p> <p><b>Miscellaneous:</b> Timers (count down/up), labeling tape (colored masking tape works), spatulas/scoopulas, tube racks (modular ones that can handle conical and microcentrifuge tubes are great)</p>
<p><b>GELS</b></p>  <p><a href="#">Contact Bio-Rad for a quote!</a></p>	<p><b>Electrophoresis Equipment:</b> Apparatuses (chambers, trays, and combs with 6+ wells) with DNA visualization capability (we recommend the miniPCR bio blueGel electrophoresis with built-in transilluminator and power supply for DNA gels), SDS-PAGE systems and power supplies for protein gels (such as Bio-Rad's Mini-PROTEAN gel system with PowerPac)</p> <p><b>Additional:</b> Microwave needed to prepare gels, light box to view protein gels, plastic container (needed as storage for poured gels or silicone practice gels)</p>

# BioTechBuilder LAB SKILLS

## Lab Skills



Introduces essential lab concepts and techniques.

## NEEDED BUT NOT SUPPLIED MATERIALS LIST

### Items and Quantities Needed for Module 1: Lab Skills

#### Topic 1: Solid Foundation

#### Topic 2: Solutions

#### Topic 3: Growing Cells

### General Supplies

- PPE for 24 students (**all topics**)
- Spray bottle with ethanol, or other disinfectant, for cleaning (**Topics 2, 3**)
- Labeling or masking tape, 10 pack (**Topics 2, 3**)
- Electronic balance with 0.01 g precision, Qty 2-6 (**Topics 1, 2**)
- Spatulas/Scoopulas, Qty 6-12 (**Topics 1, 2**)

### Pipettes

- Micropipette set (P1000, P200, P20), Qty 6-12 sets of the three pipettes (**Topics 2, 3**)
- Micropipette tips, 100-1000ul, Need 6-12 racks of 96 tips per topic (**Topics 2, 3**)
- Micropipette tips, 1-200ul, Need 6-12 racks of 96 tips per topic (**Topics 2, 3**)
- Pipette aid/bulb, Qty 6-12 (**Topics 2, 3**)

### Temperature Control

- Refrigerator or 4°C storage (can use a 3.2 cubic foot fridge without freezer or a combined fridge/freezer unit) (**Topics 2, 3**)
- Thermometers, Qty 10 (**Topic 2**)
- Hot plate with magnetic stirrer, Qty 2-4 (**Topic 2**)
- Heat-resistant gloves, Qty 2-3 pairs (**Topics 2, 3**)
- Shaking incubator, 37 °C, 180-200 rpm, Qty 1 (**Topic 3**)
- Tube rack for incubator, Qty 1 (**Topic 3**)

For Module 1, you can use a smaller incubator, such as the Benchmark incubator. You will need to purchase an additional tube rack for the Benchmark. For Module 2, you will need FOUR Benchmark incubators. For Module 3, the Benchmark will not suffice. You can use a larger incubator model for all modules.

### Glassware

- Beakers, Bottles, Flasks, and Graduated Cylinders (**Topic 2**)
  - 50ml beaker, Qty 1-2
  - 100ml beaker, Qty 6-12
  - 250ml beaker, Qty 1-2
  - 600ml bottle, Qty 3-5
  - 500ml storage bottle, Qty 12
  - Erlenmeyer Flasks, Assorted 125-250ml, Set of 5
  - Graduated Cylinders, Assorted 10ml-1L, Qty 2-3
  - Graduated Cylinders, 500ml or larger, Qty 6-12

### Equipment

- Spectrophotometer (can use plastic spectroscopy chamber from Carolina with a smartphone app in a pinch, or you can apply for a discount from Vernier for the Go Direct SpectroVis Plus), Qty 1-2 (**Topics 2, 3**)
- Multilevel modular tube rack (conical/microcentrifuge), Qty 6-12 (**Topics 1, 2, 3**)
- pH probes/meter, Qty 6-12 (**Topic 2**)

### Optional Items

- Vortexes, Optional Qty 1-2 (**Topic 3**)
- Ice buckets, Optional Qty 4-6 (**Topic 3**)
- Incubator (non-shaking second incubator), Optional Qty 1 (**Topic 3**)

# BioTechBuilder FOUNDATIONS

## NEEDED BUT NOT SUPPLIED MATERIALS LIST

### Items and Quantities Needed for Module 2: Foundations

#### Topic 4: Analyzing DNA

#### Topic 5: Analyzing Proteins



### General Supplies

- PPE for 24 students (**all topics**)
- Spray bottle with ethanol for cleaning (**Topics 4, 5**)
- Labeling or masking tape, 10 pack (**Topics 4, 5**)
- Electronic balance with 0.01 g precision, Qty 2-6 (**Topics 4, 5**)
- Spatulas/Scoopulas, Qty 6-12 (**Topics 4, 5**)

### Pipettes

- Micropipette set (P1000, P200, P20), Qty 6-12 sets of the three pipettes (**Topics 4, 5**)
- Micropipette tips, 100-1000ul, Need 9-16 racks of 96 tips, per topic (**Topics 4, 5**)
- Micropipette tips, 1-200ul, Need 18-24 racks of 96 tips, per topic (**Topics 4, 5**)
- Pipette aid/bulb, Qty 6-12 (**Topics 4, 5**)

### Temperature Control

- Refrigerator or 4°C storage (can use a 3.2 cubic foot fridge without freezer or a combined fridge/freezer unit) (**Topics 4, 5**)
- Freezer or -20°C storage (can also use a fridge/freezer unit) (**Topics 4, 5**)
- Thermometers, Qty 10 (**Topic 4**)
- Heat-resistant gloves, Qty 2-3 pairs (**Topic 4**)
- Shaking incubator, 37 °C, 180-200 rpm, Qty 1 (**Topics 4, 5**)
- Tube rack for shaking incubator, Qty 1 (**Topics 4, 5**)
- Hot water (requires tube float rack) or dry bath, Qty 1-2 (**Topic 5**)

### Glassware

- Beakers, Bottles, Flasks, and Graduated Cylinders
  - 100ml beaker, Qty 6-12 (**Topic 5**)
  - Graduated Cylinders, 100ml, Qty 4-6 (**Topic 5**)

### Equipment

- Spectrophotometer (can use plastic spectroscopy chamber from Carolina with a smartphone app in a pinch, or you can apply for a discount from Vernier for the Go Direct SpectroVis Plus), Qty 1-2 (**Topic 5**)
- Microcentrifuge with minimum 13k rpm, Qty 1-2 (**Topics 4, 5**)
- Multilevel modular tube rack (conical/microcentrifuge), Qty 12-24 (**Topics 4, 5**)
- Thermocycler, Qty 1 (**Topic 4**)

### Gel Electrophoresis Equipment

- Gel electrophoresis apparatuses (such as miniPCR bio blueGel with built-in transilluminator for DNA gels), Qty 6-12 (**Topic 4**)
- Tupperware/Plastic Container, Qty 1 minimum (**Topics 4, 5**)
- SDS-PAGE systems (such as Bio-Rad's Mini-PROTEAN gel system), Qty 2-6 (**Topic 5**)
- Power supply (such as PowerPac) for protein gel system, Qty 1 (**Topic 5**)
- Microwave to prepare gels, Qty 1 (**Topics 4, 5**)
- Light box to view protein gels, Qty 1 (**Topic 5**)

### Optional Items

- Vortexes, Optional Qty 1-2 (**Topics 4, 5**)
- Ice buckets, Optional Qty 6-12 (**Topics 4, 5**)
- Incubator (non-shaking second incubator), Optional Qty 1 (**Topics 4, 5**)

For Module 2, you can use a smaller incubator, such as the Benchmark incubator. However, you will need FOUR benchmark incubators to accommodate the number of tubes for a class of 24 students. The Benchmark will not suffice for Module 3.

# BioTechBuilder APPLICATIONS

## NEEDED BUT NOT SUPPLIED MATERIALS LIST

Applications



Introduces industrial biotech applications and commercialization practices.

### Items and Quantities Needed for Module 3: Applications

#### Topic 6: Biomanufacturing

#### Topic 7: Synthetic Biology

#### General Supplies

- PPE for 24 students (**all topics**)
- Spray bottle with ethanol for cleaning (**Topics 6, 7**)
- Electronic balance with 0.01 g precision, Qty 2-6 (**Topic 6**)
- Spatulas/Scoopulas, Qty 6-12 (**Topic 6**)

#### Pipettes

- Micropipette set (P1000, P200, P20), Qty 6-12 sets of the three pipettes (**Topics 6, 7**)
- Micropipette tips, 100-1000ul, Need 9-16 racks of 96 tips, per topic (**Topics 6, 7**)
- Micropipette tips, 1-200ul, Need 18-24 racks of 96 tips, per topic (**Topics 6, 7**)
- Pipette aid/bulb, Qty 6-12 (**Topics 6, 7**)

#### Temperature Control

- Refrigerator or 4°C storage (can use a 3.2 cubic foot fridge without freezer or a combined fridge/freezer unit) (**Topics 6, 7**)
- Freezer or -20°C storage (can also use a fridge/freezer unit) (**Topics 6, 7**)
- Heat-resistant gloves, Qty 1-3 pairs (**Topic 7**)
- Shaking incubator, 37 °C, 180-200 rpm, Qty 1 (**Topics 6, 7**)
- Tube rack for shaking incubator, Qty 1 (**Topics 6, 7**)
- Hot water (requires tube float rack) or dry bath, Qty 1 (**Topic 7**)

For Module 3, you will need an incubator that accommodates a 250 ml flask. The smaller Benchmark incubator will NOT suffice.

#### Glassware

- 250ml beaker, Qty 2-4 (**Topic 6**)

#### Equipment

- Spectrophotometer (can use plastic spectroscopy chamber from Carolina with a smartphone app in a pinch, or you can apply for a discount from Vernier for the Go Direct SpectroVis Plus), Qty 1-2 (**Topics 6, 7**)
- Microcentrifuge with minimum 13k rpm, Qty 1-2 (**Topics 6, 7**)
- Tupperware/Plastic Container, Qty 1 (**Topic 7**)
- Microwave, Qty 1 (**Topic 6**)
- Multilevel modular tube rack (conical/microcentrifuge), Qty 12-24 (**Topics 6, 7**)

#### Optional Items

- Vortexes, Optional Qty 1-2 (**Topics 6, 7**)
- Incubator (non-shaking second incubator), Optional Qty 1 (**Topics 6, 7**)