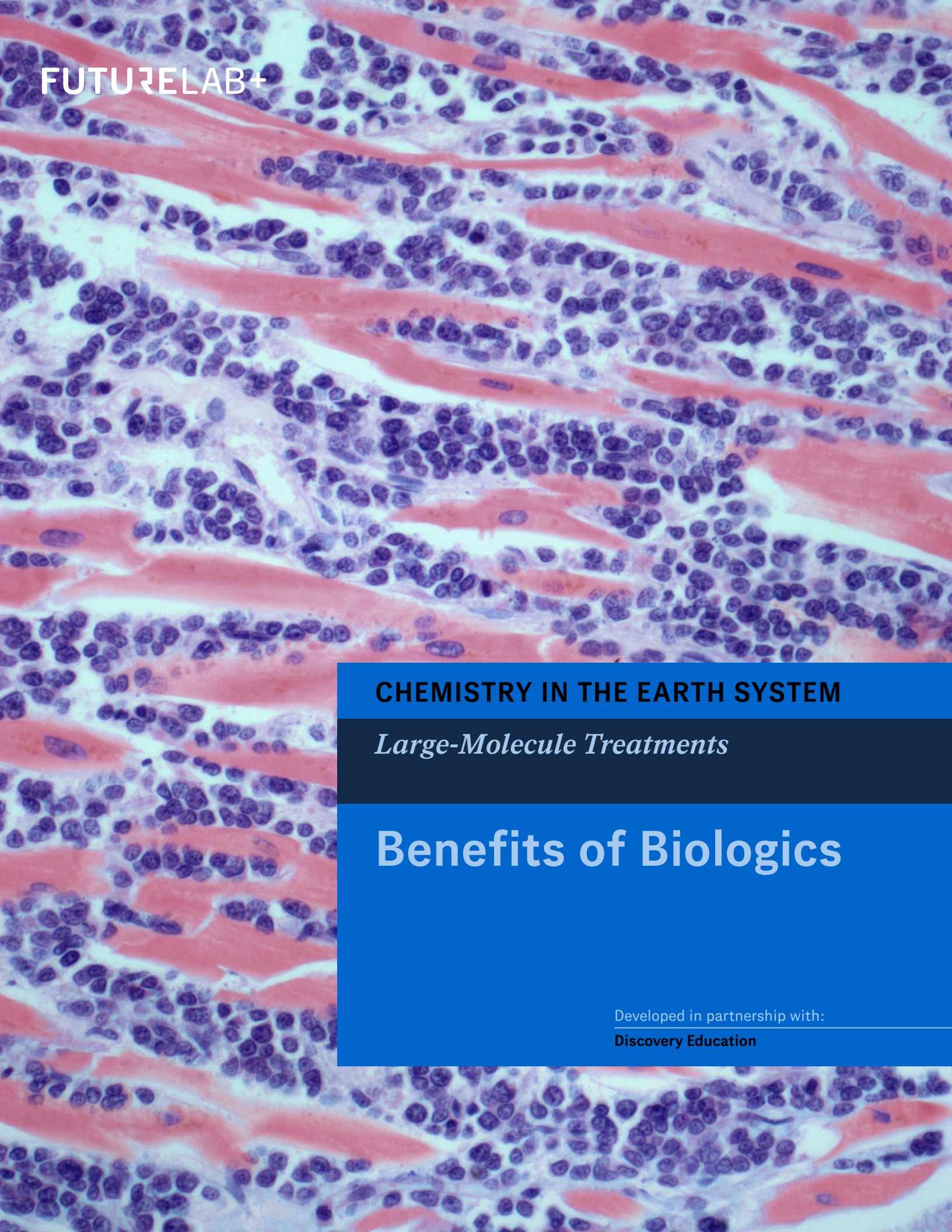

FUTURELAB+

CHEMISTRY IN THE EARTH SYSTEM

Large-Molecule Treatments

Benefits of Biologics

Developed in partnership with:

Discovery Education

In this Lesson Plan:

Print the **Teacher Section** →

Print the **Student Section** →

This document is separated into two sections, For Teachers [T] *and* Student Resources [S]*, which can be printed independently.*

Select the appropriate printer icon above to print either section in its entirety.

Follow the tips below in the Range field of your Print panel to print single pages or page ranges:

Single Pages (use a comma): T3, T6

Page Range (use a hyphen): T3–T6

Cover Image
A light micrograph of a section through cardiac muscle showing heart cancer.

CHEMISTRY IN THE EARTH SYSTEM / LARGE-MOLECULE TREATMENTS

Benefits of Biologics

DRIVING QUESTION

How are biologics changing the way treatments are created and delivered to patients facing life-threatening diseases?

OVERVIEW

In this lesson bundle, students learn about biologics: large-molecule treatments made from living cells that are engineered to produce specific proteins. The lessons begin with an overview of what biologics are and how they work. Students learn that biologics are being effectively administered to patients with a wide variety of diseases, such as cancer, multiple sclerosis, and rheumatoid arthritis. Students then compare and contrast biologics with traditional small-molecule drugs like aspirin in order to identify the benefits and limitations of each drug type. After comparing biologics and small-molecule drugs, students will form small groups and complete a card sort activity that will help them establish a timeline of the development and manufacturing process of biologic therapies. Finally, students will team up to play the role of employees of a biotechnology company tasked with presenting information about a specific biologic to potential patients. Each team will be assigned a specific biologic (such as Rituxan, Herceptin, or Avastin) and will research the disease that the biologic can be used to treat, the mechanism of action, and the benefits of the biologic over other treatments. Teams will use household or craft materials to build a 3D model that demonstrates the mechanism of action of their biologic. Finally, the teams will use their research and models to create and film explainer videos for the company that provide important information for patients about the benefits of their biologic.

ACTIVITY DURATION

Three days (45-minute sessions)

ESSENTIAL QUESTIONS

What are biologics and how are they different from small-molecule drugs?

What are the advantages of using biologics to treat disease?

Why is it important that people know about the developments being made in the field of biologics?

OBJECTIVES

Students will be able to:

Compare and contrast the mechanisms of action of small-molecule drugs and biologics.

Discuss the advantages and drawbacks of using biologics to treat disease.

Research how biologics are being used to treat a specific disease.

Explain how a specific type of biologic drug works by creating a 3D model

Create an explainer video that will give information to patients about a biologic drug.

STUDENT TASKS

Day 1	*Day 2*	*Day 3*
Identify how small-molecule drugs work in the body. Discuss the limitations of small-molecule drugs. Discover biologics. Create a timeline of the product cycle of biologic therapies by completing a card-sorting activity.	Conduct research on a biologic and the disease that uses it as a treatment. Understand and explain the biologic's mechanism of action. Create a 3D model that demonstrates the mechanism of action.	Use an online video-editing platform to create an explainer video that gives information about biologics and their value in disease treatment and therapy.

MAKE CONNECTIONS!

How does this connect to careers?

Biologics specialty pharmacists are experts in knowing how biologics interact with different drugs a patient might be taking. They know the differences between brand name and generic drugs and can counsel a patient on the health effects and potential cost of their biologic drugs.

Biologics manufacturers take raw biological materials and turn them into life-saving therapies. They are experts at transporting and sustaining biological materials—a logistical challenge that requires a great deal of problem solving. Biologics manufacturers set up and maintain clean, safe lab settings where biologics are produced.

Bioinformatics analysts use computer systems to store and interpret biological information. Through the field of bioinformatics, we are able to use computer models to see how proteins function and establish genetic links like evolutionary relationships.

Regulatory affairs specialists work to help biotech companies adhere to all federal, state, and local regulations that apply to their products. These experts in biologics maintain knowledge of specific requirements that apply to special drugs.

Biologics sales representatives persuade doctors and patients that their company's treatments are safe, effective, and better than what their competitors offer. They must be very familiar with how therapies work in order to communicate about them with medical experts.

How does this connect to our world?

During the Covid-19 pandemic biologics held the promise of the future. According to the FDA, biologics "may offer the most effective means to treat a variety of medical illnesses and conditions that presently have no other treatments available." It's likely you have interacted with a biologic before—vaccines, blood products, hormonal therapies and insulin are all examples of biologics. You've also likely heard of other potential biologic treatments, like stem cell therapy. Biologics might unlock treatment for previously incurable diseases, but they also pose challenges: these special drugs are expensive to develop and difficult to store. Plus, there are bioethical questions at play with the use of live material in developing medicines. In this lesson, students explore the benefits and drawbacks of using biologics to treat diseases. They'll reflect on how these powerful therapies have impacted their lives and think about how to convey the power of these treatments to patients who might benefit from them.

Pedagogical Framing

Instructional materials are designed to meet national education and industry standards to focus on in-demand skills needed across the full product development life cycle—from molecule to medicine—which will also expose students and educators to the breadth of education and career pathways across biotechnology.

Through this collection, educators are equipped with strategies to engage students from diverse racial, ethnic, and cultural groups, providing them with quality, equitable, and liberating educational experiences that validate and affirm student identity.

Units are designed to be problem-based and focus on workforce skill development to empower students with the knowledge and tools to be the change in reducing health disparities in communities.

SOCIAL-EMOTIONAL LEARNING

Students practice social awareness and self-management skills to successfully understand what others are feeling and to appreciate and interact positively with diverse groups during the lesson. Some students may have personal experience with pathological and genetic disease. They will carry that experience with them into sensitive discussions. This requires all discussion participants to demonstrate empathy and practice important self-management skills.

CULTURALLY AND LINGUISTICALLY RESPONSIVE INSTRUCTION

This lesson applies culturally and linguistically responsive instruction to the study of content connected to how biologics work within our bodies. Students will also explore the role of employees at a biotechnology company who are tasked with presenting information about a specific biologic to potential patients. The lesson offers opportunities for the growth of critical consciousness of self and community, while encouraging students to imagine how what they've learned applies to real-world professional experiences. Imagining themselves creating biologics will have a powerful effect on the ability of students to reflect on how they can help others through drug development.

COMPUTATIONAL THINKING PRACTICES

In this lesson, students put three computational thinking strategies into practice: abstraction, decomposition, and developing algorithms and building models. Students utilize abstraction to create metaphors describing how biologics work, and to isolate similarities between biologics and small-molecule drugs. Students use the computational thinking strategy of developing algorithms to put the process of building a biologic into a step-by-step order, and they then use the strategy of building models to construct a simulation of a biologic's mechanism of action.

ADVANCING INCLUSIVE RESEARCH

Biologics are complex drugs that require an exceptional degree of health literacy to comprehend. This lesson explains why it is important that biomedical companies demonstrate cultural competency and communicate effectively when working with patients who might require biologics in their course of care. In order to ensure patients are able to make informed decisions and consent, special consideration must be taken to ensure that the information communicated to them is culturally relevant and in the language that they speak.

CONNECTION TO THE PRODUCT LIFE CYCLE

Until recently, small-molecule drugs were the common treatment for potentially life-threatening diseases. Now, many biologic medicines and therapies are being developed to help people with these diseases live longer and more fulfilling lives and overcome their diseases. These therapies, and the careers associated with development, testing, and bringing them to market, are located in the **development** phase of the product life cycle.

Day 1

Slides 1–8

CULTURALLY AND LINGUISTICALLY RESPONSIVE INSTRUCTION

The use of random calling strategies allows for non-volunteerism in student responses. It also prevents unconscious bias from affecting who might be called upon to answer in any given situation. Culturally diverse learners need to be included in class discussions, even if some scaffolding might be needed to help them to participate.

COMPUTATIONAL THINKING IN ACTION

By developing an analogy about how aspirin works to prevent blood clots, students are using the computational thinking strategy of abstraction. Abstraction is a tool that allows programmers to "zoom out" and look at the big picture. By using an analogy to explain the function of aspirin, students are using the tool of language to isolate one essential component or function of this multifaceted drug.

INDUSTRY AND CAREER CONNECTION

As students learn how aspirin interacts with other molecules, they are simulating the work of pharmacists. These professionals are educated in how drugs interact with the body and with each other. Pharmacists who specialize in biologics complete additional training to become familiar with these complex drugs.

SLIDES 1–8

Students consider what happens when a person takes aspirin. (10 minutes)

1	To begin this lesson, direct students' attention to the picture of a bottle of aspirin on the screen. Use the *See, Think, Wonder* strategy to introduce the activity. Use a *Pick a Stick* or other random-calling strategy to ask students to share something that they see, think, or wonder about the picture.
2	Continue using *Pick a Stick* to ask students to share some reasons why someone would take an aspirin.
3	Ask students to think about what happens when a person takes an aspirin—where does it go and how does it work?
4	Allow students to share their ideas with the whole group.
5	Play the video clip *How Does Aspirin Work?* which shows how aspirin is used to help someone who is at risk of heart disease. ***Students should already have a basic understanding of how the structure of an enzyme allows it to bind with other specific molecules.***
6	After viewing the video, ask students to do a *Turn and Talk* with an elbow partner to create an analogy that represents the way aspirin works to help prevent a person from getting a blood clot.
7	Allow a few pairs to share their ideas with the class with a *Stand and Share*.
8	Show the video clip *How Aspirin Works*, which explains how aspirin can help reduce pain and inflammation. Ask students to identify how the two video clips are similar in showing the "mechanism of action" of aspirin—how it relates to other molecules in the body.
9	Students should recognize that acetylsalicylic acid (ASA) binds to other molecules to prevent cellular communication pathways from being completed.
10	Ask students to discuss with their *Turn and Talk* elbow partner if they should revise their original analogy about how aspirin works.

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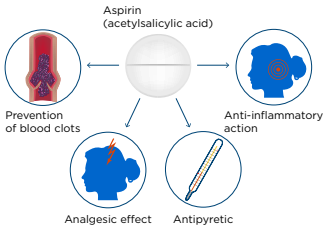
Day 1

Continued

Slides 9–10

Useful Properties of Aspirin



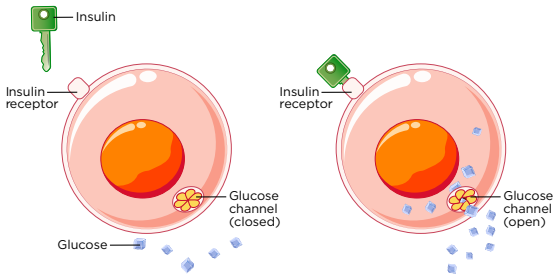
Slides 9–10

Student groups research an assigned small-molecule drug to better understand how it works. (10 minutes)

1 Divide the students into two groups (right and left sides of the classroom) and ask them to use their student devices to research how insulin (students on the right) or antihistamines (students on the left) work.

2 Give students 3–5 minutes to research and discuss their conclusions with their group. Have each group choose a spokesperson to explain to the class how insulin or antihistamines work.

Mechanism of Action of Insulin



3 Clarify for students that they should notice that these drugs work in much the same manner: they bind to specific receptors and block actions from happening in the cell and the body.

4 Ask the student pairs from previous steps to share their revised analogies with the whole group using a *Round Robin* protocol.

5 Explain to students that drugs such as aspirin, insulin, and antihistamines are classified as "small-molecule drugs." These types of pharmaceuticals are traditionally given to patients to help fight or prevent disease, and, while they are effective for certain ailments, there are limitations to small-molecule drugs.

6 Ask students to complete a *Quick Write* to answer the following question: *While these types of drugs have benefits, what might be some of the limitations of using small-molecule drugs to treat disease?*

7 Have students share their answers with their *Turn and Talk* partners.

Continues next page >

Day 1

Continued

Slides 11–14

COMPUTATIONAL THINKING IN ACTION

As students compare and contrast small molecule drugs with biologics, they are using the computational thinking strategy of abstraction. Abstraction allows computer scientists to "zoom out" and focus on just the information they need. Venn diagrams are abstraction tools that help isolate pertinent information: in this case, the similarities and differences between biologics and small molecule drugs.

Slides 11–14

Students gain a better understanding of disease treatment pathways by reading articles and contributing to class discussions. (15 minutes)

1	Tell students that, for the next part of this lesson, they will be learning about an emerging class of manufactured drugs called "biologics." Explain that for this part of the lesson, they will be comparing and contrasting small-molecule drugs and biologics by creating a giant Venn diagram.
2	Lay two large hula-hoops in the middle or front of the classroom so that they overlap in the middle, creating a Venn diagram. Lay an index card that says "small-molecule drugs" at the top of one hoop and another card that says "biologics" at the top of the other hoop.
3	Ask students to choose partners and spread out around the classroom. Give student pairs a sticky note pad and paper copies of the articles *Defining the Difference: What Makes Biologics Unique* and *What are the drugs of the future* or ask students to go to the links on their student devices.
4	As they read through the articles, student pairs should record on their sticky notes information about both types of drugs that can be used to compare and contrast them.
5	As students finish reviewing the article, they should bring their sticky notes to the hula hoop Venn diagram and place them in the area for small-molecule drugs, biologics, or in the middle where the hula hoops intersect if it is something that both types of drugs share.
6	Choose three students and assign each one of the three sections of the hula hoop Venn diagram. They should check their sections for repeated statements and remove any sticky notes that are repeated.
7	Give each student a copy of the *Disease Treatment Pathways Venn Diagram Capture Sheet*. Ask the three students to read the statements in their sections to the class. As the three read, the remaining students should record the statements on their capture sheets.
8	Once students are finished, ask them to reflect on their completed Venn diagram. Using the *Snowball Fight* strategy, ask them to share some of the advantages and disadvantages of using biologics to treat disease. Have students pick up and read aloud a "snowball" in a quick *Whip Around*.

Continues next page >

Day 1

Continued

Slides 15–18

COMPUTATIONAL THINKING IN ACTION

As students organize the cards into the order necessary for making a biologic drug, they are using the computational thinking strategy of building algorithms. Algorithms are step-by-step instructions on how to accomplish a task. Programmers use algorithms to instruct computers on what to do. By building algorithms, we can identify small, manageable steps needed for completing a task and revise things as needed. This can streamline everything from making a cake to driving to school.

Slides 15–18

Students share their understanding of biologics by sorting cards, creating a timeline, and making connections to previous content. (10 minutes)

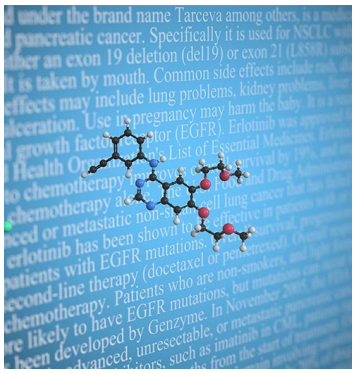
1	Divide students into groups of three. Give each group a set of *Building Biologics Cards*, a roll of tape, and a meter stick.
2	Explain to students that they will work together to read the information on the cards and put them in chronological order to show the steps necessary to create a biologic drug. Students should use the tape to attach the cards to the meter stick in the order they think the steps would occur.
3	Give student groups eight minutes to complete their card sort. For the final two minutes, allow students to visit another group and compare the order of their cards. They should discuss differences and make revisions as necessary.
4	Tell students that they will view the video *How It's Made* that will show them the process by which biologic drugs are manufactured in the laboratory. Groups should check their card sorts as you display the video on the front screen, using pause and play, and make any changes necessary to the order of their cards. Choose one student group to hold up the correct timeline in the front of the classroom and read through each step in order for all other groups to check their timelines. Students should use their cell phones or student devices to take a picture of their timelines so they will have them for future use.
5	To conclude Day 1 of this lesson, ask students to complete the *3-2-1 Bridge* described on the slide. Ask students to get out a piece of paper and write down three new thoughts or ideas, two new questions, and one new analogy about the topic of biologics. They should turn these in as they leave the classroom.
6	Ensure that students understand that biologics are very different from small-molecule drugs and that, while there are drawbacks to biologics in terms of their complexity and cost, they promise to be more effective at targeting disease than traditional pharmaceuticals.

Day 2

Slides 19–25

INDUSTRY AND CAREER CONNECTION

As students think about how to present biologic drugs to potential patients, they are taking on the role of biologic sales representatives. These professionals educate doctors and patients on how drugs work, and persuade them that the drug they are selling produces optimal results. In order to do this, these sales professionals must be very familiar with how the drugs they are selling work in the body.



COMPUTATIONAL THINKING IN ACTION

Here, students are using the computational thinking strategy of building models to simulate the mechanism of action for a biologic. This strategy allows students to advance their understanding of a process by testing and tweaking things in real time.

Slides 19–21

Students role-play as an employee who is tasked with explaining the mechanism of action of their assigned biologic to potential patients. (10 minutes)

1. Begin class by explaining to students that now that they have an understanding of the importance of biologics in the treatment of human disease, they will form groups of four and play the role of employees at a biotechnology company tasked with presenting information about a specific biologic to potential patients.

2. Ask students to form groups of four. Ask each group to draw (or give each group) a *Biologic Assignment Links Strip*. This will tell them the name of their biologic and provide helpful links they can use to complete this part of the project.

3. Explain that groups will begin by using the links to investigate the mechanism of action of their biologic, and to find other helpful information.

Teacher Note > *If students are unfamiliar with the mechanism of action of a molecule, the instructor may want to show the video* Insulin synthesis and mechanism of action 3D animation *(starting at 1:50) and explain how it shows what insulin does to bring glucose into a cell.*

Slides 22–25

Students will create a 3D model that demonstrates the mechanism of action for the biologic they researched. (35 minutes)

1. Give each group a copy of the *Biologic Research Capture Sheet*. Ask students to work together using their student devices to complete their research by exploring the links from their link strips. The instructor should circulate to answer questions about the mechanism of action of the biologics and monitor student progress.

2. Students should have 15 minutes to complete their research.

3. Once they have completed their research, each group will use modeling supplies provided (construction paper, scissors, markers, colored pencils, glue, etc.) to create a 3D model of the mechanism of action of the biologics.

Continues next page >

Day 2

Continued

Slides 22–25

4	Give student groups 20–25 minutes to work together to create their 3D models.
5	For the final 10–15 minutes of the class period, use a *Gallery Walk* to display the models. Have one person from each group stay with the model to demonstrate the biologic's mechanism of action. After other students have made the rotation, those who stayed with the models should look at each model as a group and explain their own group's model as they come to it in the rotation. Students and the instructor may use sticky notes left at each model to give feedback on ways the groups may clarify or improve their models.
6	Have students create a bridge between their first response and today's response. Ask them to explain how their new responses connect to their initial responses.
7	Have a few students share how their thoughts changed around their responses to biologics in the *3-2-1 Bridge* activity.

Day 3

Slides 26–29

Slides 26–29

Students will work in groups to create an explainer video that gives information about biologics and their value in disease treatment and therapy for patients. (45 minutes)

1	Begin the class by telling students that in the final part of the lesson, they will use a video editing website to film and edit a short explainer video that will inform potential patients about their biologic and why it could be a helpful treatment for their disease.
2	Explain to students that one requirement for the explainer video is that they use the 3D models they created in the previous session to show their assigned biologic's mechanism of action.
3	Students will remain in the groups in which they designed the 3D model. Give each group an *Explainer Video Outline Capture Sheet* and the *Explainer Video Rubric*. Tell students that, before they film their video, they should work together to complete the outline. Tell students that the outline also gives links to various online video platforms such as *Flip*, *iMovie*, and *Screencastify*. They should choose the platform that will work best for them or that they are most familiar with to create their explainer video.
4	Give student groups time to collaborate and complete their outlines. The instructor should circulate and visit each group to answer questions and do a progress check on the video outlines for accuracy.
5	Once the groups have completed their outlines, they may make revisions to their 3D models based on the feedback they receive.
6	Student groups should be given the remainder of the class session to film and edit their explainer videos. Once all videos are finished, they can be uploaded to a class website or a sharing site, such as *Flip*, for students to view and leave comments. If time allows, the class can watch each video and give feedback on the finished product.

National Standards

Next Generation Science Standards

Science Engineering Practices (SEP)

Practice 7
Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world that reflects scientific knowledge, and student-generated evidence.

Connections to Nature of Science Scientific Investigations Use a Variety of Methods

Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings.

Disciplinary Core Ideas (DCI)

LS1.A
Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life.

ETS1.B
Developing Possible Solutions

There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.

Crosscutting Concepts (CC)

Stability and Change

Feedback (negative or positive) can stabilize or destabilize a system.

Educator Resources

Building Biologics Cards

Directions

Copy and cut out enough copies for groups of three students to each have a set.

Note: These cards on this page are in the correct order from left to right, top to bottom.

Identifying the Desired Molecule Scientists determine which molecule to produce by discovering which will bind to the target molecule.	**Cell Programming** Genetic engineering techniques are used to introduce the desired sequence of DNA into the Chinese hamster ovarian cells (CHOs) that will use the sequence as an instruction manual to make proteins.
Cell Transfer The CHO cells are transferred to a growth medium composed of hundreds of nutrients.	**Cell Line Creation** The CHO cells divide, copying themselves thousands of times to create a cell line.
Production For two weeks, the cells are transferred into progressively larger bioreactors containing a growth medium, where they will expand into trillions of cells.	**Purification Cell Line Creation** Scientists filter the cells through resin beads to separate the biologic from the cell and unwanted proteins and impurities.
Storage The purified proteins are stored in steel tanks at -20 degrees Celsius to keep the biologic medicine in a stable state.	**Quality Control** Samples of the biologic medicine are placed in glass capsules and then into a robotic analytical instrument that measures the potency and purity of the biologic medicine.
Production The biologic is moved into sterile glass vials by a fill station. Computers analyze the vials to ensure they are filled and sealed properly.	**Inspection and Testing** Technicians visually inspect the contents of vials for impurities and conduct tests on samples to ensure they are sterile.

Educator Resources

Biologic Assignment Link Strip

Directions

Cut on the dotted lines so each biologic strip can be distributed to student groups. They will investigate an assigned biologic and record their learning on the Biologic Research Capture Sheet.

Biologic	Helpful Links to Get Started		
Herceptin	*Herceptin® (trastuzumab)—Information for Patients*	*HER2+ Stomach Cancer*	*HER2+ Breast Cancer*

Biologic	Helpful Links to Get Started	
Avastin	*How Avastin® (bevacizumab) works for metastatic colorectal cancer (mCRC)*	*Avastin® (bevacizumab)—Information for Patients*

Biologic	Helpful Links to Get Started	
Lucentis	*Lucentis® (ranibizumab injection) — Information for Patients*	*About Lucentis® (ranibizumab) for Wet Age-related Macular Degeneration (wAMD)*

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Educator Resources

Biologic Assignment Link Strip

Continued

Biologic	Helpful Links to Get Started	
Ocrevus	*Ocrevus® (ocrelizumab)—Information for Patients*	*Ocrevus® (ocrelizumab)*
Rituxan	*Rituxan® (rituximab Immunology])—Information for Patients*	*Rituximab Injection*
Tarceva	*Tarceva® (erlotinib)—Information for Healthcare Providers*	*Erlotinib, Marnett Research Laboratory, Vanderbilt University*

Helpful Links to Get Started
Erlotinib

Continues next page >

Educator Resources

Biologic Assignment Link Strip

Continued

Biologic	Helpful Links to Get Started
Alecensa	*How Alecensa® (alectinib) May Help Newly Diagnosed* *Alecensa® (alectinib) Mechanism of Action*

Biologic	Helpful Links to Get Started
Actemra	*Actemra® (tocilizumab)—Information for Patients* *Tocilizumab Injection* *About Actemra® (tocilizumab) Treatment for Healthcare Professionals*

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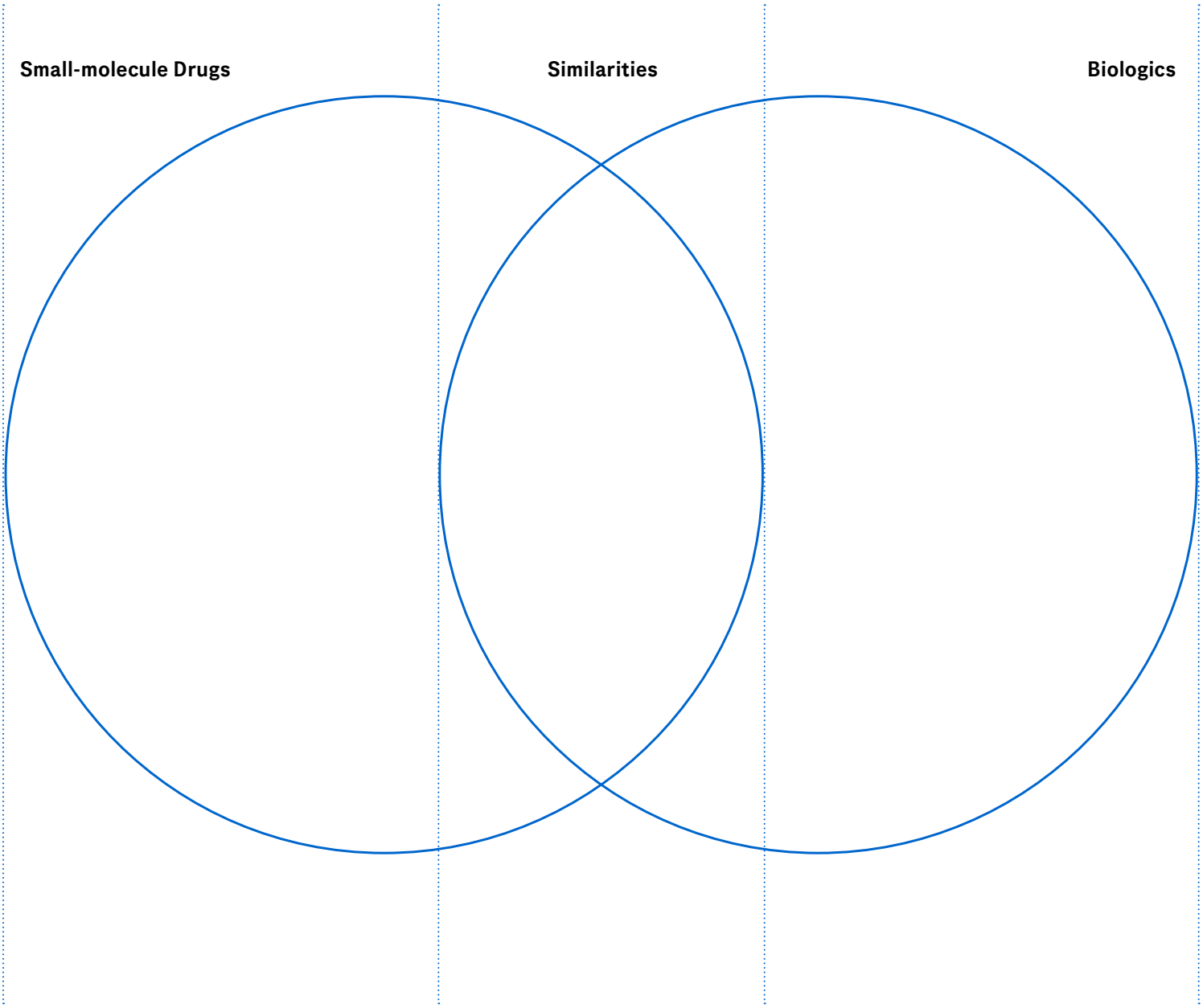
Disease Treatment Pathways Venn Diagram Capture Sheet

Directions

In partners, read the assigned article to find similarities and differences among disease treatment pathways. Record your findings in the appropriate space.

Defining the Difference: What Makes Biologics Unique

What are the Drugs of the Future



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Biologic Research Capture Sheet

Directions

In your group, research the assigned biologic. Begin by using the links strip provided to investigate the mechanism of action and find other helpful information.

1	Name of biologic medicine	
2	Name of the company that manufactures it	
3	What ailment is this biologic used to treat?	
4	What receptor does it target?	

Continues next page >

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Biologic Research Capture Sheet

Continued

5	Describe this biologic's mechanism of action	
6	Diagram this biologic's mechanism of action	
7	How does this biologic help the patient on a cellular level?	
8	Is there any data on the effectiveness of this biologic medicine? If so, what does it show?	

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Explainer Video Outline Capture Sheet, Part 1

Pre-Production Planning

Directions

Complete this capture sheet to create an outline before you film and edit your explainer video for your biologic medicine.

1. How will your explainer video do the following?

a	Relay a call to action What you want your audience to do after watching.	
b	State the problem that needs to be solved	
c	Match your intended audience	
d	Convey your message? Actors, voiceover, animation, etc.	

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Explainer Video Outline Capture Sheet, Part 1

Pre-Production Planning

Continued

2. Who on your team will be in charge of filming the video?

3. Who on your team will be in charge of editing the video?

4. What platform will be used to edit the video?
   Platform Options: *Flipgrid*, *iMovie*, *Screencastify*.

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Explainer Video Outline Capture Sheet, Part 2

Storyboard

Directions

Use the boxes below to create a simple storyboard for your explainer video. The lined section is for the voice or text. The space below is for your sketch.

Optional: Use a digital storyboard app, such as Storyboard That

Example

Researchers worked hard

to develop a solution.

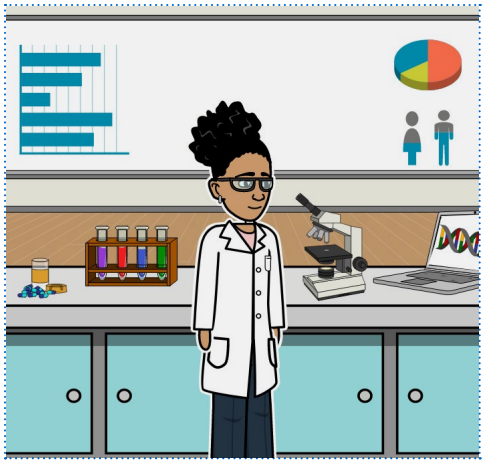

Image created with *Storyboard That*

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Explainer Video Outline Capture Sheet, Part 2

Storyboard

Continued

1

2

3

4

5

6

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Explainer Video Rubric

Directions

Evaluate the video by responding with reflective comments based on the expectations below. Use the space in the center column to share evidence with the group. Use the Feedback column for areas of growth and the Exceeded column for areas that excel.

Feedback How can this video be improved?	Baseline How does this video meet expectations?	Exceeded How does the video exceed expectations?
	Content: video is thorough and has lots of good information.	
	Style: video is clear and easy to understand.	
	Accuracy: video includes facts and cites sources.	
	Format: video shows prior preparation and uses visual aids and tools as necessary.	