

GLENCOE

BIOLOGY



Ease the Transition to Next Generation Science.

Whether your district has already adopted Next Generation Science Standards (NGSS) or is considering adopting them or any other new standards, *Glencoe Biology* ensures a seamless transition.

The increased pace of change in education in the last few years has created seismic shifts in the delivery and consumption of educational materials. Students want to connect what they learn in the classroom to what they see happening in the real world – today!

We deliver to you the most effective, innovative, and inspiring high school biology curriculum that meets both NGSS and local science standards. Whether you’re looking for a hybrid digital-print or a digital-first program, McGraw-Hill Education is your trusted advisor.

With *Glencoe Biology* you are equipped to:

- Meet science standards **Performance Expectations (PEs)**.
- Integrate **Science and Engineering Practices** into your science classroom.
- Apply the **Disciplinary Core Ideas (DCIs)**.
- Correlate your lessons to **NGSS**.

***Glencoe Biology*:** Leveraging technology to drive personalized student success while engaging and motivating students with hands-on, project-based activities and real-world applications.

McGraw-Hill Education: Our tools, platforms, and services are focused on serving the needs of educators and learners through our purposeful technology, proven differentiated pedagogy, and unmatched professional development.

CONTENTS

Program Overview	ii	Integrated Student Resources	9
Ramp Up the Engagement	4	Science in Action	10
<i>LearnSmart</i> ®	5	Apply Interactive Practice	11
Time-Saving Technology Tools	6	Effective Results	12
Plan and Prepare on the Go	7	eAssessment	13
Real-World Connections	8	Practical Professional Development	14

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When you combine
the **science of learning**
with the **art of teaching**,
there's no limit to what
students can achieve.





RAMP UP THE ENGAGEMENT...

To create memorable learning experiences.

To meet you wherever you are on the digital spectrum, *Glencoe Biology* interactive learning and teaching resources are easy-to-use, whether you're a technology novice, digital native, or somewhere in the middle.



connectED

ConnectED is your digital teaching platform making it easy and convenient to customize lessons, review assignments, and communicate with students.

Plan, Teach, and Assess with *ConnectED*.

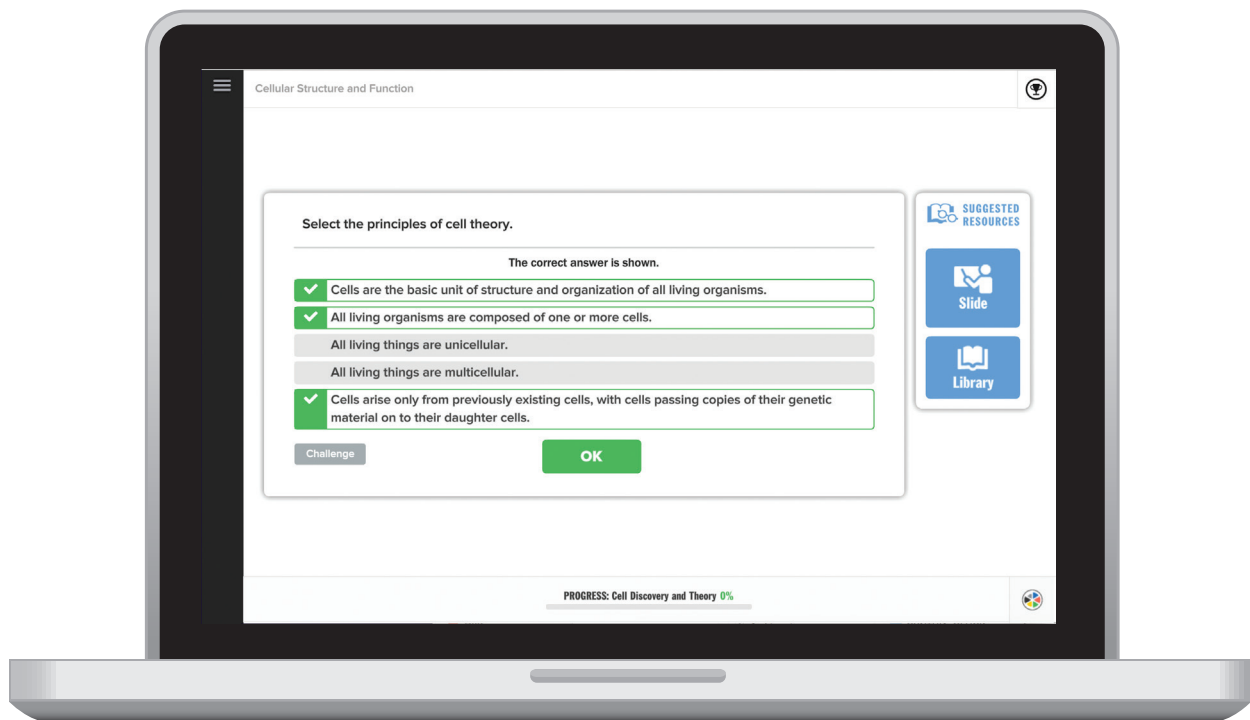
Increase Knowledge Retention with LEARNSMART®.

The *LearnSmart*® adaptive learning engine with *SmartBook*® gives every student a unique learning path and every teacher the power to reach all students in class.

SmartBook is an eBook whose text is fully integrated with *LearnSmart* technology. As a student reads, this technology determines precisely which learning objectives he/she understands and which ones he/she struggles with, highlighting the most critical content for the student to read next.

Learning Resources close knowledge gaps by immediately clarifying the concepts the student finds most challenging.

The personalized study resources your students need today to master state assessment tomorrow



Pinpoint knowledge gaps for individual students and across classes.

Empower students to personalize their learning experiences with optimal learning paths so they spend more time on what they don't know with *LearnSmart*.

- Practice of basic biology concepts to improve recall and application before moving on
- Additional exposure and increased practice to master new concepts
- Presentation of concepts individual students struggle to master



TIME SAVING TECHNOLOGY...

To optimize your productivity

Give your students the resources they need on the go! The *student eBook* helps students turn biology in the real world into learning moments by giving students access to their program materials and resources anytime and anywhere.

Empower students to learn from biology as-it-happens with the *student eBook* which learners can access anytime and anywhere using the Open eBook icon.

Plan and Prepare On-The-Go

The *ConnectED Mobile App* gives access to your Biology program including *student eBook*, planning tools, reference materials, and other program resources. *ConnectED Mobile* is available on select Chromebook, iOS, and Android™ devices.



Use the ConnectED Mobile App to:

- Access all the courses available to you in ConnectED.
- Download *student eBook* for use offline, whenever you need it.
- Review lesson plans from the Plan & Present tab from the *ConnectED Teacher Center* dashboard.
- Manage the content you download to the app.
- Retrieve a comprehensive list of resources from the Resource tab from the *ConnectED Teacher Center* dashboard.

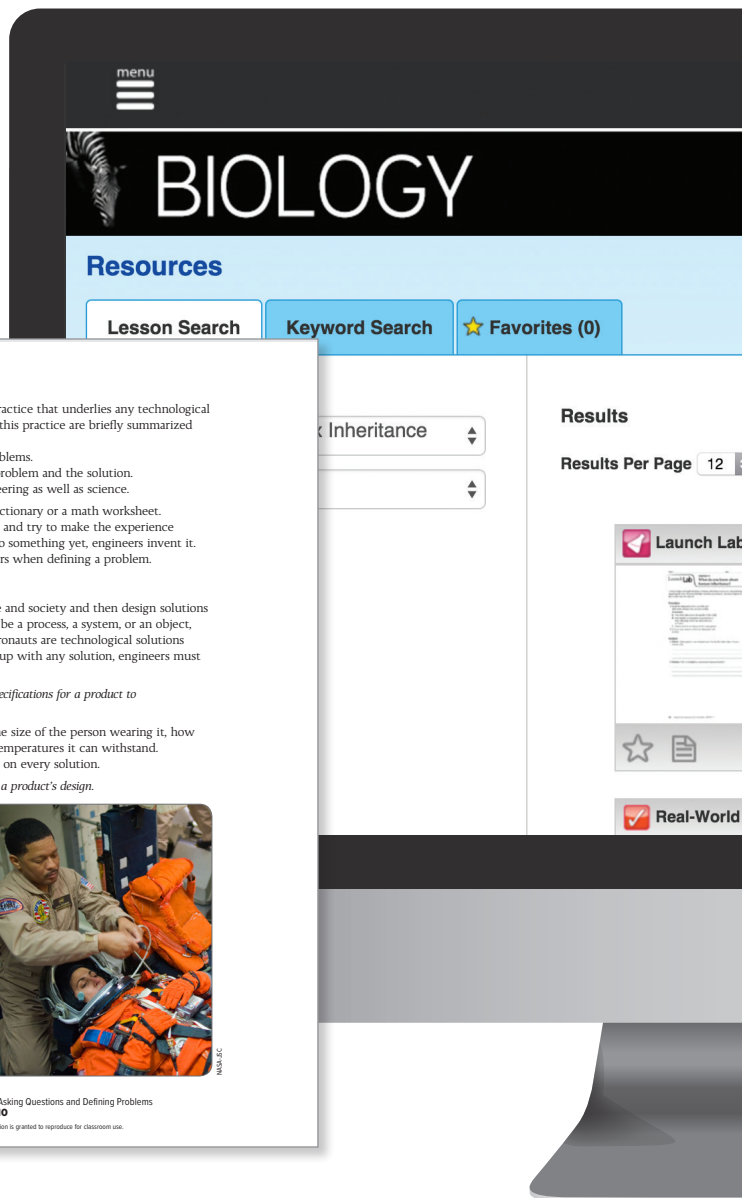
Real-World Connections

Be confident helping students achieve more! Use the *Science and Engineering Practices Handbook* to introduce the skills to students and support their scientific investigations and engineering projects.

As a reference book, the *Science and Engineering Practices Handbook* provides students with background information, definitions, examples, and Quick Practice activities to stimulate and reinforce learning.

The *Science and Engineering Practices Handbook* is an easy-to-use reference for all eight practices.

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information



Defining Problems

Defining problems is an engineering practice that underlies any technological solution. The different components of this practice are briefly summarized below.

1. Engineers design solutions to problems.
2. Problem statements outline the problem and the solution.
3. Asking questions is part of engineering as well as science.

Defining problems doesn't involve a dictionary or a math worksheet. Engineers study how people do things and try to make the experience better. If people don't have a way to do something yet, engineers invent it. Engineers have to consider many factors when defining a problem.

Seeking a Solution

Engineers identify problems for people and society and then design solutions to those problems. The solution could be a process, a system, or an object, such as a tool. Space suits worn by astronauts are technological solutions designed by engineers. When coming up with any solution, engineers must consider many criteria.

Criteria are requirements or specifications for a product to be successful.

Criteria for a space suit may include the size of the person wearing it, how easy it is to move around in, and the temperatures it can withstand. Engineers also have certain constraints on every solution.

Constraints are limitations on a product's design.

For example, some materials may not be durable enough or may be too expensive to use. Major constraints include time, energy, space, and the availability of tools and materials. Other important constraints are the number of people working on the project, how much money is available for the project, and what information about the project exists.



Space suits have many criteria for safety and functionality.

Find the Practices Handbook in your teacher resources.

Integrated Student Resources

Written to meet each Next Generation Science Standard (NGSS) performance expectation, **Applying Practices Worksheets** and **Project-Based Learning Activities** (PBLs) challenge your students to solve real problems in the real world. These sheets are editable, downloadable, accessible online, and designed to meet specific performance expectations.

Student resources, learning activities, and worksheets are embedded for point-of-use access. Students can use these dynamic resources immediately to practice new concepts.

Students practice biology in action with these learning tools.

- **Applying Practices** and **Project-Based Learning Activities** that integrate traditional science content with science and engineering practices
- Design-your-own labs
- Guided laboratory investigations
- Modeling activities
- Research and communicate projects

Name _____ Date _____ Class _____

APPLYING PRACTICES Can Scientists Model Natural Selection?

Safety Precautions
small, medium, and large beads
forceps
short-nosed pliers
tray or pan
stopwatch

Materials
small, medium, and large beads
forceps
short-nosed pliers
tray or pan
stopwatch

Background
Natural selection is the mechanism that Darwin proposed to explain evolution. Through natural selection, traits that allow individuals to have the most offspring in a given environment tend to increase in the population over time.
In this lab you will investigate natural selection by modeling the survival and reproductive success of predators with varying means of capturing prey (pliers or forceps). In rounds, you will behave as if you are 10 individual pliers and 10 individual forceps, and combine your data with that of the class in order to gather data for an entire population of tools. Within your population of tools you will then determine if natural selection will lead to adaptation, that is, an increase in the proportion of the number of individuals that have a trait that seems best suited to capturing the prey.

Question
How can natural selection be modeled in a laboratory setting?

Procedure
1. Read and complete the lab safety form.
2. Divide into groups of three. One student will use forceps to represent one adult member of a predator population, one will use pliers to represent another adult member of the predator population, and the third will keep time and score.
3. Mix prey items (60 beads of various sizes) on a tray or pan.
4. In 20 seconds, both forceps and pliers predators will try to pick up all possible beads.
5. After 20 seconds, assign three points for each large bead, two points for each medium bead, and one point for each small bead.
6. Add up the points and use the following rules:
a. survival of the predator requires 18 points, and
b. ability of the predator to produce one new offspring (maximum) requires an additional 10 points (minimum score of 28 points total).
7. Determine the number of survivors and the number of offspring.
8. Repeat the procedure 10 times, using all 60 of the beads provided for each round, and combine your data with other groups.

Applying Practices • Can Scientists Model Natural Selection?
1
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Find Applying Practice Worksheets in your teacher resources and teacher blades. Also accessible at point-of-use in student resources.

Science in Action

Glencoe *Biology* offers you diverse lab opportunities to deepen your students' understanding of science by experiencing it and experimenting with biology first-hand!

Use these lab activities included in every chapter to bring science to life for your students.

- Launch Labs
- MiniLabs
- Data Analysis Labs
- BioLabs

More lab resources are available to you through ConnectED, including:





- Lab Manual
- Forensic Labs
- Open Inquiry Labs
- Guided Inquiry Labs
- Probeware Labs
- Video Labs
- Virtual Labs

Name _____ Date _____ Class _____

Launch Lab

CHAPTER 1
Why is observation important?

Scientists use a planned, organized approach to solving problems. A key element of this approach is gathering information through detailed observations. Scientists extend their ability to observe by using scientific tools and techniques.

Procedure    

1. Read and complete the lab safety form.
2. Pick an unshelled **peanut** from the **container of peanuts**. Carefully observe the peanut using your senses and available tools. Record your observations.
3. Do not change or mark the peanut. Return your peanut to the container.
4. After the peanuts are mixed, locate your peanut based on your recorded observations.

Data and Observations

Analysis



1. List the observations that were the most helpful. Which were the least helpful?

Launch Lab

Why is observation important?

Scientists use a planned, organized approach to solving problems. A key element of this approach is gathering information through detailed observations. Scientists extend their ability to observe by using scientific tools and techniques.

For a lab worksheet, use your StudentWorks™ Plus Online.

 [Inquiry](#)  [Launch Lab](#)

Launch Lab is found on the chapter opener.

VIRTUAL LABS

Cell Reproduction

How can cancer cells be recognized?

Purpose
In this Investigation you will explore the similarities and differences between the cell cycles of normal cells and cancer cells.

Objectives:

- Identify the various phases of the cell cycle.
- Compare and contrast the cell cycles of normal and cancer cells.

Procedure:

1. Click the TV to watch the video about the cell cycle.
2. Click Information to read about cancer statistics and risk factors.
3. On the biology laboratory navigation

[Journal](#) [Calculator](#) [Table](#)

Table of Contents

- [Interphase](#)
- [Prophase](#)
- [Metaphase](#)
- [Anaphase](#)
- [Telophase](#)

Normal Lung

Tissue Slides

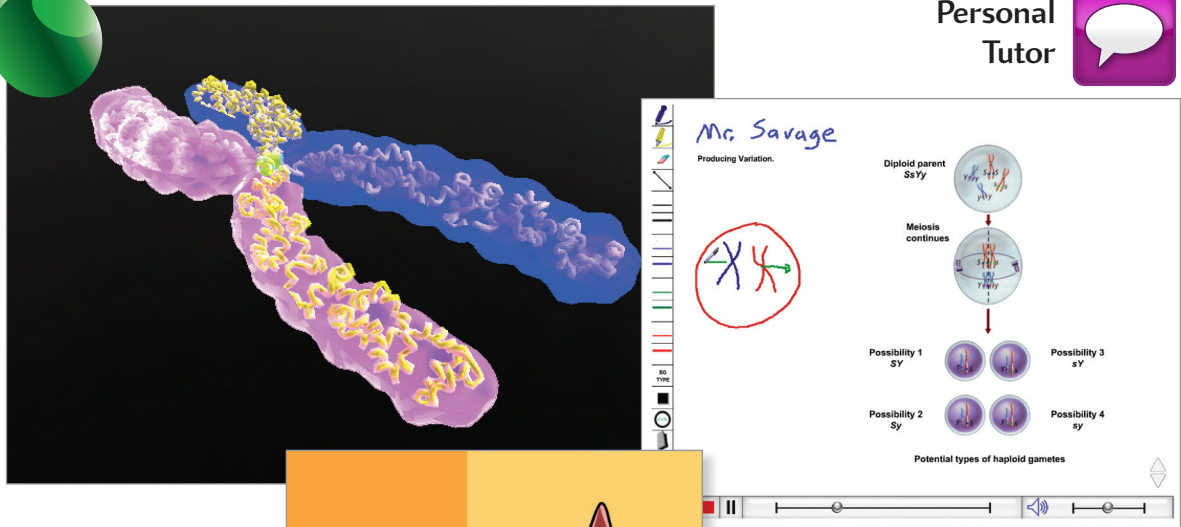
[Check](#)

[Reset](#) [Return](#)

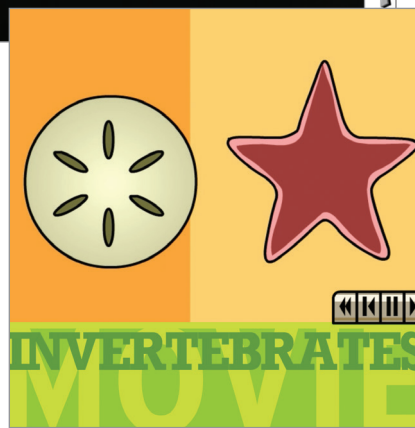
Cyber Science 3D[®]



Personal
Tutor



Expanded features such as Personal Tutor, BrainPOP[®], and Cyber Science 3D[®] go beyond the limitations of the printed page.



Brain
POP[®]

Apply Interactive Practice.

Students have their own digital learning platform called the *ConnectED Student Center*, complete with student worksheets and digital resources. Assignments you create appear in their to-do lists. Students can message you directly and submit their work.

Use expanded Student Center features such as **Personal Tutor**, **BrainPOP[®]**, and **Cyber Science 3D[®]** videos to go beyond the limitations of the printed page and bring science into your student's lives like never before.

Encourage students to see science all around them with **Biology MiniGames**. These fun MiniGames present key biology topics from course material using sci-fi themed games with their own style and plots.



EFFECTIVE RESULTS...

To support student success

Easy-to-use *eAssessment* with reporting tools equip you with the data you need to make informed instructional decisions and keep students engaged.

- ***eAssessment*** supports diverse types of evaluations and includes online scoring and report generation for digital and/or print distribution.
- **Professional Development** resources including pertinent information on new science standards and implementation best practices are available to you at point-of-use.

Turn Students into Star Performers with **eAssessment**.

Turn your classroom into a biology success center with **eAssessment** suite – a robust resource – giving you powerful tools to assess student progress and make data-driven instructional decisions.

The **eAssessment** reporting feature means you'll always have access to valuable data on individual students and whole classes to help you differentiate and support student mastery of concepts appropriately.

Identify students with knowledge gaps to make data-driven instructional decisions with **eAssessment**.

Other features of **eAssessment** to help increase your efficiency include:

- Question Bank with questions organized by strand, subject, and lesson.
- Report generation on proficiency and accuracy.
- Create and customize premade diagnostic and summative evaluations.

The screenshot displays the McGraw-Hill eAssessment interface. On the left, there are navigation panels for 'Question Sets' and 'Tests'. The 'Question Sets' panel shows a tree view of chapters 2 through 12, with 'Chapter 8' selected. The 'Tests' panel shows 'My Tests', 'Shared Content', and 'Glencoe Biology' with various sub-topics like 'Bacteria & Virus', 'cell reproduction', and 'cellular respiration'. The main area shows the 'Chapter 8 Assessment (Ancillary)' test generator. It displays a 'Multiple Choice' question: '1. Which defines energy?' with options 'a. ability to do work', 'b. creation of heat', 'c. increase of disorder', and 'd. power to change'. The answer is 'a'. Below this, another question is partially visible: '2. Which is the biological import...' with options 'a. creates glucose from light', 'b. makes biological proteins', 'c. provides chemical energy', and 'd. repairs cell membranes'. The answer is 'c'. A third question is also partially visible: '3. Which occurs during the Krebs...' with options 'a. breaking down pyruvate', 'b. capturing light energy', 'c. creating glucose molecules', and 'd. producing ethyl alcohol'. The answer is 'a'. A fourth question is also partially visible: '4. Which is an autotroph?' with options 'a. daisy', 'b. earthworm', and 'c. mushroom'. The answer is 'a'. On the right, an 'Assignment Results' window is overlaid, showing the date 'June 11, 2014', the assignment 'Practice Homework', the student 'Sample Student', the class '2nd Period', the school 'SAMPLE SCHOOL', and the term. The score is '13 / 87'. Below this, a table shows the results for 14 questions.

Question #	Question Type	Points	Response
X	1	True / False	0 / 1 T
X	2	True / False	0 / 1 F
	3	True / False	1 / 1 T
	4	True / False	1 / 1 T
X	5	True / False	0 / 1 T
	6	True / False	1 / 1 F
	7	True / False	1 / 1 T
	8	True / False	1 / 1 F
	9	True / False	1 / 1 F
X	10	True / False	0 / 1 F
	11	True / False	1 / 1 T
	12	True / False	1 / 1 F
X	13	True / False	0 / 1 T
	14	True / False	1 / 1 T

eAssessment suite collects valuable data for every student and the class.

Practical Professional Development

The right tools make all the difference in getting your work done efficiently. Seamlessly embedded digital resources and the convenient print materials of *Glencoe Biology* gives you everything you need to make science relevant, rigorous, and possible for every student. Designed on the principles of effective professional development (PD), *Glencoe Biology* PD includes self-paced courses, Foldables® and NGSS videos, and on-demand webinars.

Get Started

Online, self-paced Quick-Start course designed to get teachers and administrators up and running fast.

Learn More

Online Implementation course designed to help teachers connect professional learning to the classroom.

Watch It

Videos from Dinah Zike and on-demand webinars and videos support great instruction in the classroom.



Where and When You Need It

In just a few clicks, you can quickly access relevant, timely, and ongoing **Professional Development** videos and webinars available to you, on-demand.

Directly embedded in *Glencoe Biology* is your interactive professional learning program. Learn how other science educators have successfully implemented the program and increase your awareness of new science standards.

Relevant Resources for science educators

Rich, web-based resources include modeled classroom instruction videos, implementation support, technology resource optimization, and professional learning community support.

Use the ConnectED Professional Development tab to access on-demand webinars and these free video libraries:

- Dinah Zike/Foldable Videos
- Science and Engineering Practices Videos
- Pedagogical/Instructional Support Videos
- On-Demand Webinars

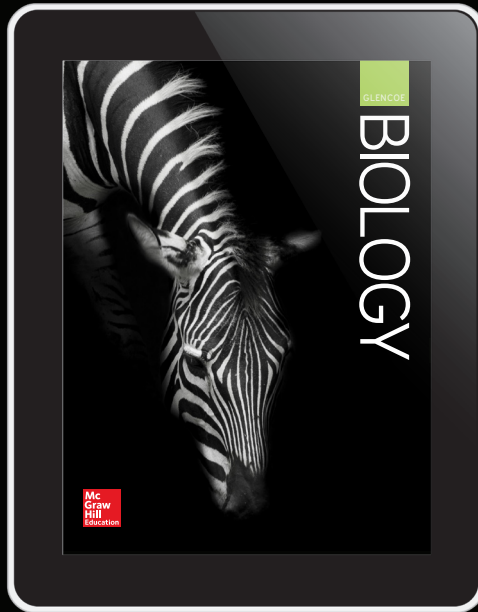
Customized, comprehensive, and expertly-crafted solutions translate into meaningful program success.

The screenshot displays the McGraw Hill Education ConnectED Professional Development interface for Biology Teacher Center. The interface features a sidebar with navigation options such as ConnectED, Class Management, Resources, Assignment Tracker, Calendar, My Files, Home, Plan and Present, Assessment, Standards, Professional Development, Glossary, Notebook, My Messages, and My Discussions. The main content area is titled 'Professional Development' and includes sections for Implementation Support, Dinah Zike/Foldable Videos, Science and Engineering Practices Videos, Digital Instruction Videos, On-Demand Webinars, and Blueprints for Success. A grid of video thumbnails is visible, with titles like 'VKV Flashcards t...', 'Foldables and VK...', 'Using Foldables t...', 'Independent Fold...', 'Creating Indepen...', and 'Choosing Foldables'. A 'Media' window is open, showing a video of Dinah Zike holding a white card.



GLENCOE

BIOLOGY



Sample and Discover Online
mheonline.com/glencoescience