ModelIt!

Standards Alignment & Curriculum Guide

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NGSS · ISTE · National Health Science · Biotech Skills Alignment
for K-12 Computational Modeling

K K-12 Grades	# 282 Lessons	5 5 Standards Frameworks

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1 The 10 Biotech Skills

Every ModelIt! lesson develops a subset of **10 core biotechnology modeling skills**, organized into five progressive categories. These skills mirror the competencies used by professional biomedical researchers and computational biologists. Students practice these skills repeatedly across grade bands, building fluency from kindergarten through 12th grade.

5 Categories: Model Construction (building) → Simulation Setup (configuring) → Model Analysis (interpreting structure) → Simulation Analysis (interpreting behavior) → Debugging & Revision (improving)

Model Construction

1. Add/Remove Components
2. Move Components
3. Name Components
4. Add/Remove Relationships

Simulation Setup

5. View/Remove Simulation Components
6. Set/Modify Activity Levels

Model Analysis

7. Identify Relationship Directionality
8. Identify Dependent/Independent Variables

Simulation Analysis

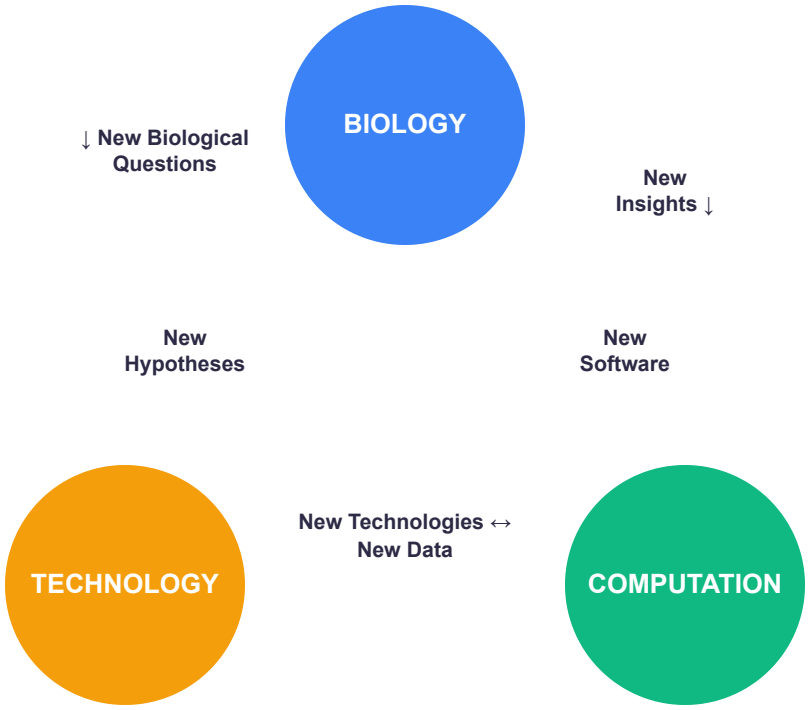
9. Identify Component Activity/Output

Debugging & Revision

10. Identify/Correct Model Errors

2 How the Biomedical Profession Operates

Modern biomedical research operates at the intersection of three disciplines: **Biology**, **Technology**, and **Computation**. These fields form a continuous cycle where discoveries in one area generate questions and innovations in the others.



© Institute for Systems Biology

ModelIt! brings this professional research cycle into K-12 classrooms. Students engage with each phase: they study *biological systems* (from gravity in kindergarten to gene regulation in high school), use *computational technology* (the Cell Collective modeling platform), and apply *computational thinking* (building, simulating, analyzing, and debugging models). This mirrors the actual workflow of biomedical researchers and computational biologists worldwide.

From Researchers to the World's Top Universities

1000s of researchers, teachers, and students across the world use Cell Collective to learn, build, and simulate biological models. The platform has been adopted by leading universities for undergraduate and graduate courses in systems biology, computational modeling, and biomedical research.

Universities Using Cell Collective

Carnegie Mellon | UCLA | UC Irvine | San Francisco State | Columbia | U of Toronto | Caltech | Manchester | Virginia Tech | Purdue | Waterloo | West Virginia | Brown | Tufts | Georgetown | U of Nebraska | Emory | U Rochester | U Delaware | UC Merced | Anderson U | Rider U | U of Kent | Southern Wesleyan | Lindenwood | Grove City | Hastings

From Research Labs to K-12 Classrooms

The same platform trusted by top research universities is now available to K-12 students through ModelIt! Every lesson uses the Cell Collective engine, giving young learners access to the same computational tools used by professional scientists.

4 Research Foundation

The following **peer-reviewed, published research articles** document best practices for teaching with the Cell Collective / ModelIt! computational modeling platform. These studies, led by Dr. Tomas Helikar and his team at Helikar Labs (University of Nebraska-Lincoln) and Discovery Collective, provide the evidence base for the pedagogical approach used across all ModelIt! lessons.

PEER-REVIEWED • BIOSCIENCE
Bergan-Roller, H. E., Galt, N. J., Chizinski, C. J., Helikar, T., & Dauer, J. T. (2018). Simulated computational model lesson improves foundational systems thinking skills and conceptual knowledge in biology students. *BioScience*, *68*(8), 612–621.
https://doi.org/10.1093/biosci/biy054

PEER-REVIEWED • SPRINGER NATURE (BOOK CHAPTER)
Dauer, J., Dauer, J., Lucas, L., Helikar, T., & Long, T. (2022). Supporting university student learning of complex systems: An example of teaching the interactive processes that constitute photosynthesis. In O. Ben Zvi Assaraf & M.-C. P. J. Knippels (Eds.), *Fostering understanding of complex systems in biology education* (pp. 63–82). Springer.
https://doi.org/10.1007/978-3-030-98144-0_4

PEER-REVIEWED • INTERNATIONAL JOURNAL OF SCIENCE EDUCATION
Lucas, L., Helikar, T., & Dauer, J. T. (2022). Revision as an essential step in modeling to support predicting, observing, and explaining cellular respiration system dynamics. *International Journal of Science Education*, *44*(13), 2152–2179.
https://doi.org/10.1080/09500693.2022.2114815

PEER-REVIEWED • INTERNATIONAL JOURNAL OF SCIENCE EDUCATION
King, G. P., Bergan-Roller, H. E., Galt, N. J., Helikar, T., & Dauer, J. T. (2019). Modelling activities integrating construction and simulation supported explanatory and evaluative reasoning. *International Journal of Science Education*, *41*(13), 1764–1786.
https://doi.org/10.1080/09500693.2019.1640914

PEER-REVIEWED • CBE—LIFE SCIENCES EDUCATION
Booth, C. S., Song, C., Howell, M. E., Rasquinha, A., Saska, A., Helikar, R., Sikich, S. M., Couch, B. A., van Dijk, K., Roston, R. L., & Helikar, T. (2021). Teaching metabolism in upper-division undergraduate biochemistry courses using online computational systems and dynamical models improves student performance. *CBE—Life Sciences Education*, *20*(1), ar13.
https://doi.org/10.1187/cbe.20-05-0105

PEER-REVIEWED • CBE—LIFE SCIENCES EDUCATION
Clark, C. A. C., Helikar, T., & Dauer, J. T. (2020). Simulating a computational biological model, rather than reading, elicits changes in brain activity during biological reasoning. *CBE—Life Sciences Education*, *19*(3), ar45.
https://doi.org/10.1187/cbe.19-11-0237

5 Bringing This to K-12

The Cell Collective platform has been used for over a decade in biomedical research and university education. Dr. Tomas Helikar and his team at the University of Nebraska originally built Cell Collective for researchers to construct, simulate, and analyze complex biological models. Over time, the platform proved equally powerful as a teaching tool, and universities worldwide adopted it for systems biology courses.

Now Discovery Collective is bringing this research-grade computational modeling platform to K-12 schools. Through the ModelIt! curriculum, students from kindergarten through 12th grade develop the same systems thinking and computational modeling skills used by professional biomedical scientists. The curriculum spans 282 lessons across all grade bands, with every lesson carefully aligned to Next Generation Science Standards (NGSS), International Society for Technology in Education (ISTE) standards, and National Health Science Education (NCHSE) standards.

Every ModelIt! lesson follows a consistent lesson model: **Locate** the system components, **Establish** the relationships between them, **Visualize & Model** the system in the platform, **Evaluate Outcomes** by running simulations, and **Revise & Extend** the model based on research. Students move through all five phases in a single session, building, testing, and refining a computational model in approximately 40 minutes.

Across grade bands, students progressively develop 10 core biotechnology modeling skills, from basic model construction in early elementary to sophisticated debugging and revision in high school. By the time students complete the K-12 sequence, they have built foundational competencies in computational modeling, systems thinking, and biomedical research methodology.

Dropping ModelIt! Into Your Existing Unit

ModelIt! is a supplement, not a replacement for your science curriculum. Each lesson stands alone, but it becomes even more powerful when students revisit their model throughout a unit. Here are easy ways to weave it in:

At the start of a unit	Use this lesson to introduce the phenomenon. Students build a “first draft” model based on what they already know. Save it.
After a reading or lab	Have students reopen their model and update it: “Based on what you just learned, would you add a component? Change a relationship?” Takes 10–15 minutes.
As a “what-if” tool	When students ask questions during class, say: “Great question — go test that in your model!” Students run new scenarios and report back.
For peer discussion	Partners compare models: “Why does your model have this arrow and mine doesn’t?” Differences spark scientific debate using evidence.
As a presentation tool	Students project their model and walk the class through it live — showing components, running scenarios, answering audience “what-if” challenges in real time.
At the end of a unit	Compare Day 1 model to final model. The growth IS the assessment — students see how their thinking evolved.

6 Health Science Career Pathway

NCHSE Healthcare & Human Services Career Cluster

Elementary Career Awareness → **Middle School** Career Exploration → **Secondary** Career Preparation → **Postsecondary** Career Specific

Biotechnology Research & Development

ModelIt! directly prepares students for the **Biotechnology Research & Development** sub-cluster within the NCHSE Health Science Career Cluster. Students build computational models of biological systems, a core competency in modern biomedical research.

11 NCHSE Foundation Standards

Highlighted standards are directly addressed by ModelIt! lessons (FS1, FS3, FS7, FS9, FS11).

1. **FS1:** Academic Foundation
2. **FS2:** Communications
3. **FS3:** Systems
4. **FS4:** Employability Skills
5. **FS5:** Legal Responsibilities
6. **FS6:** Ethics
7. **FS7:** Safety Practices
8. **FS8:** Teamwork
9. **FS9:** Health Maintenance
10. **FS10:** Technical Skills
11. **FS11:** Information Technology

7 Standards Overview & Table Legend

Five Alignment Frameworks

N

NGSS — Next Generation Science Standards

The primary science content standards. Each lesson targets one or more NGSS Performance Expectations (PEs) that define what students should know and be able to do.

I

ISTE — International Society for Technology in Education

Technology and computational thinking standards. ModelIt! lessons align to ISTE standards 1, 3, 4, 5, 6, and 7 through digital modeling, simulation, and data analysis.

H

NCHSE — National Health Science Standards

Career and technical education standards for health science pathways. ModelIt! lessons address Foundation Standards 1, 3, 7, 9, and 11 through biomedical content and digital tools.

C

CA Health Ed — California Health Education Standards

State-level K-12 health education standards. Lessons addressing human body systems, disease, nutrition, and wellness align to grade-appropriate CA Health Ed content areas.

B

10 Biotech Skills — ModelIt! Modeling Competencies

Ten skills across five categories (Model Construction, Simulation Setup, Model Analysis, Simulation Analysis, Debugging & Revision) that define computational modeling proficiency.

Table Column Legend

Column	Description
Grade	Grade level (K, 01-12) or Nature's Engineers (NE)
Level	Curriculum level (L1 = foundational, L2 = advanced, L3 = AP/honors)
Lesson Title	The student-facing title of the lesson
NGSS PE	NGSS Performance Expectation code(s) addressed
ISTE	ISTE student standard codes aligned (e.g., 5a, 5c, 4a)
Biotech Skills	10 dots representing the 10 Biotech Skills. ● = practiced, ○ = not addressed. Grouped: MC(1-4) | SS(5-6) | MA(7-8) | SA(9) | DR(10)
NCHSE	National Health Science Foundation Standard codes (e.g., FS1.1, FS11)
CA Health Ed	Grade-appropriate California Health Education alignment indicator

8 Alignment Table: Kindergarten — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
K	L1	Why Do Things Fall Down?	K-PS2-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
K	L1	What Makes Things Move?	K-PS2-2	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
K	L1	Does the Sun Warm Everything the Same?	K-PS3-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
K	L1	What Do Plants Need to Grow?	K-LS1-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
K	L1	Where Do Animals Live?	K-LS1-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.2, FS1.3, FS11, FS9.1	✓
K	L1	What's the Weather Like Today?	K-ESS2-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
K	L1	Can We Stop a Flood?	K-ESS3-2	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
K	L1	Where Does Rain Come From?	K-ESS2-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
K	L1	How Do We Take Care of Earth?	K-ESS3-3	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
K	L1	What Happens When You Push Harder?	K-PS2-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	

8 Alignment Table: Grade 01 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
01	L1	How Does Sound Travel?	1-PS4-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
01	L1	Why Can We See Through Some Things?	1-PS4-3	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
01	L1	How Do Baby Animals Look Like Their Parents?	1-LS3-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
01	L1	What Do Animals Need to Survive?	1-LS1-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11, FS9.1	✓
01	L1	How Do Animals Use Their Body Parts?	1-LS1-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.1, FS1.2, FS1.3, FS11, FS9.1	✓
01	L1	Why Is It Dark at Night?	1-ESS1-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
01	L1	How Do Seasons Change?	1-ESS1-2	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
01	L1	Can You Send a Message with Light?	1-PS4-4	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
01	L1	How Do Plants Grow from Seeds?	1-LS1-1	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	
01	L1	What Makes a Shadow?	1-PS4-3	1a, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ○	FS1.3, FS11	

8 Alignment Table: Grade 02 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
02	L1	Can You Bend Water?	2-PS1-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
02	L1	Where Did the Puddle Go?	2-PS1-4	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
02	L1	Why Do Some Seeds Travel Far?	2-LS2-2	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
02	L1	Can Plants Grow Without Soil?	2-LS2-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
02	L1	Why Don't We See Dinosaurs?	2-LS4-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
02	L1	How Do Maps Help Us Find Things?	2-ESS2-2	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
02	L1	What Makes Wind Blow?	2-ESS2-3	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
02	L1	How Fast Does Ice Melt?	2-PS1-4	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
02	L1	Why Are There So Many Kinds of Bugs?	2-LS4-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
02	L1	How Do Rocks Tell Stories?	2-ESS1-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 03 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
03	L1	Why Do Magnets Stick?	3-PS2-3	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
03	L1	Can You Predict the Weather?	3-ESS2-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
03	L1	Why Do Animals Live in Groups?	3-LS2-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
03	L1	How Do Fossils Form?	3-LS4-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
03	L1	Why Do Some Animals Look Different?	3-LS3-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
03	L1	How Does Water Shape the Land?	3-ESS2-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
03	L1	What Happens When Habitats Change?	3-LS4-4	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
03	L1	Can Plants Survive Without Bees?	3-LS2-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
03	L1	How Can We Protect Against Natural Hazards?	3-ESS3-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
03	L1	Why Do Objects Move Differently?	3-PS2-1	1a, 3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 04 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
04	L1	Why Do Roller Coasters Go So Fast?	4-PS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L1	How Does Your Phone Hear Your Voice?	4-PS4-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L1	Why Can't You See in the Dark?	4-PS4-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L1	Why Do Animals Have Superpowers?	4-LS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
04	L1	How Does Your Brain Know That's Hot?	4-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
04	L1	Why Are There Seashells on Mountains?	4-ESS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L1	Can a River Eat a Mountain?	4-ESS2-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L1	Where Does Your Electricity Come From?	4-ESS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L1	Can We Stop an Earthquake from Breaking Buildings?	4-ESS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L1	Why Do Marbles Crash and Bounce?	4-PS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 04 — L2

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
04	L2	The Energy Roller Coaster: Where Does Speed Come From?	4-PS3-1, 4-PS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L2	Can Sound Travel Through Space?	4-PS4-1, 4-PS4-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L2	Why Do Some Animals Survive Winter?	4-LS1-1, 4-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS9.1	✓
04	L2	The Mountain That Used to Be an Ocean	4-ESS1-1, 4-ESS2-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L2	Can We Power a City with Wind?	4-ESS3-1, 4-PS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L2	Building for the Big One: Earthquake Engineering Lab	4-ESS3-2, 4-ETS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L2	Chain Reaction: When Energy Moves Object to Object	4-PS3-3, 4-PS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L2	Why Does a Black Car Get Hotter?	4-PS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L2	Can You Hear a Tsunami Coming?	4-PS4-3, 4-ESS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
04	L2	Why Does Your Bike Rust?	4-PS1-2, 4-ETS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 05 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
05	L1	When Trees Become Matches	5-ESS2-1	3d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●○ ● ●	FS1.3, FS11	
05	L1	Nature's Recycling System	5-LS2-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	✓
05	L1	Powered by the Sun	5-PS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L1	Earth's Hidden Water	5-ESS2-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L1	The Disappearing Act	5-PS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L1	Where Does a Tree's Mass Come From?	5-LS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L1	The Mushroom Network Under Your Feet	5-LS2-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	✓
05	L1	How Soap Actually Destroys Viruses	5-PS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS7.1	✓
05	L1	Whose Air Is This?	5-ESS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11, FS9.1	✓
05	L1	The Light You're Seeing Is Already Old	5-ESS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 05 — L2

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
05	L2	The Carbon Cycle: Where Does Your Breath Go?	5-LS1-1, 5-LS2-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L2	Solar vs. Fossil: The Energy Showdown	5-PS3-1, 5-ESS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L2	The Water Crisis: Who Gets the Water?	5-ESS2-2, 5-ESS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L2	Phase Changes: When Matter Transforms	5-PS1-2, 5-PS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L2	The Food Web Puzzle	5-LS2-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
05	L2	Earth Systems Collide: Volcanoes, Climate, and Life	5-ESS2-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L2	Starlight and Distance: Mapping the Universe	5-ESS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L2	Why Does Ice Cream Melt Faster on a Hot Day?	5-PS1-1, 5-PS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L2	Can a River Change Direction?	5-ESS2-1, 5-ESS2-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
05	L2	Why Do Some Things Dissolve and Others Don't?	5-PS1-1, 5-PS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 06 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
06	L1	Why Can't You See Your Own Cells?	MS-LS1-1, MS-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
06	L1	When the Earth Cracks Open	MS-ESS2-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L1	Why Your Hot Cocoa Betrays You	MS-PS3-3, MS-PS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L1	The Rock That Remembers Everything	MS-ESS2-1, MS-ESS2-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L1	Slime Is Serious Science	MS-PS1-1, MS-PS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L1	Your Body Is a City of Trillions	MS-LS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
06	L1	The Invisible Plant Factory	MS-LS1-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L1	Can You Outsmart a Disaster?	MS-ESS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L1	Your Sneakers Are Made of Dinosaurs	MS-PS1-3, MS-PS1-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L1	The Secret War in Your Backyard	MS-LS2-2, MS-LS2-3, MS-LS2-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 06 — L2

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
06	L2	Who Eats Who? Energy Flow Through Food Webs	MS-LS2-3, MS-LS2-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
06	L2	Why Does Your Coffee Get Cold?	MS-PS3-3, MS-PS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L2	Plate Tectonics: Predicting Where Earth Will Crack Next	MS-ESS2-2, MS-ESS2-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
06	L2	Inside the Cell: The Factory That Runs Your Body	MS-LS1-1, MS-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
06	L2	Atoms Rearrange: Modeling Chemical Reactions	MS-PS1-2, MS-PS1-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L2	The Invisible Plant Factory: Photosynthesis Deeper	MS-LS1-6, MS-LS1-7	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L2	Engineering a Solution: The Design Process	MS-ETS1-1, MS-ETS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L2	Why Does It Feel Colder When It's Windy?	MS-PS1-4, MS-PS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L2	Why Can't Two Plants Share the Same Sunlight?	MS-LS2-1, MS-LS2-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
06	L2	Why Do Some Countries Run Out of Water?	MS-ESS3-1, MS-ESS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓

8 Alignment Table: Grade 07 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
07	L1	Blood Moon: When the Sky Turns Red	MS-ESS1-1, MS-ESS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
07	L1	Your Inner Fish	MS-LS4-1, MS-LS4-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L1	Earth Has a Fever	MS-ESS3-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L1	The Invisible Force That Charges Your Phone	MS-PS2-3, MS-PS2-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L1	Every Drop You Drink Is Recycled Dinosaur Water	MS-ESS2-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L1	Why Hot Cheetos Make You Cry	MS-LS1-8	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
07	L1	Why You Can't Slide Forever	MS-PS3-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L1	The Crime Scene in Every Rock	MS-ESS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L1	We Built a Better Dog (And Maybe a Mistake)	MS-LS4-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L1	Your Phone Speaks in 1s and 0s	MS-PS4-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 07 — L2

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
07	L2	The Invisible War: How Your Immune System Fights Back	MS-LS1-3, MS-LS1-8	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1	✓
07	L2	DNA Decoded: Why You Are (Mostly) Unique	MS-LS3-1, MS-LS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	
07	L2	Ocean Currents and Climate: The Conveyor Belt	MS-ESS2-6, MS-ESS3-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L2	Newton's Laws: Why Things Move the Way They Do	MS-PS2-1, MS-PS2-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L2	Evolution in Action: How Species Change Over Time	MS-LS4-1, MS-LS4-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L2	Electromagnetic Spectrum: Beyond Visible Light	MS-PS4-2, MS-PS4-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L2	Rock Cycle Deep Dive: From Magma to Mountain	MS-ESS2-1, MS-ESS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L2	Why Do You Weigh Less on the Moon?	MS-PS2-4, MS-ESS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L2	Why Are Cheetahs Losing Their Speed?	MS-LS4-6, MS-LS4-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
07	L2	Can We Run Out of Rare Earth Metals?	MS-ESS3-1, MS-ESS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 08 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
08	L1	Superbugs: Evolution You Can See	MS-LS4-4, MS-LS4-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS7.1	✓
08	L1	The Reef Is Bleaching	MS-LS2-1, MS-LS2-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11, FS9.1	✓
08	L1	Your Phone's Dirty Secret	MS-ESS3-3, MS-ESS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L1	Why Hurricanes Are Getting Angrier	MS-ESS2-5, MS-ESS2-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L1	The Roller Coaster Equation	MS-PS3-1, MS-PS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L1	The Concussion Problem	MS-PS2-1, MS-PS2-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11	✓
08	L1	How LeBron Turns Food Into Dunks	MS-LS1-5, MS-LS1-7	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
08	L1	Why Do You Look Like That?	MS-LS3-1, MS-LS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L1	Your Music Is a Wave	MS-PS4-1, MS-PS4-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L1	Hand Warmers and Hidden Reactions	MS-PS1-4, MS-PS1-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 08 — L2

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
08	L2	Survival of the Fittest: Can You Outrun Natural Selection?	MS-LS4-4, MS-LS4-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L2	Trophic Cascades: When Predators Disappear	MS-LS2-1, MS-LS2-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11, FS9.1	✓
08	L2	Why Baking Soda Explodes: Reaction Rates and Energy	MS-PS1-2, MS-PS1-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L2	Climate Feedback Loops: Why Small Changes Get Big	MS-ESS2-6, MS-ESS3-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L2	Potential to Kinetic: The Energy Transformation Chain	MS-PS3-1, MS-PS3-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L2	Genetic Mutations: When DNA Makes a Typo	MS-LS3-1, MS-LS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
08	L2	Wave Properties: Amplitude, Frequency, and Speed	MS-PS4-1, MS-PS4-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L2	Why Is Gold So Different from Iron?	MS-PS1-1, MS-PS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
08	L2	How Does a Cut Heal Itself?	MS-LS1-4, MS-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11	✓
08	L2	Why Is Groundwater Disappearing?	MS-ESS3-1, MS-ESS2-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 09 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
09	L1	Why Do Athletes Collapse in the Heat?	HS-LS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
09	L1	The Vaping Crisis: What's Really Happening to Your Lungs?	HS-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS9.1	✓
09	L1	Can We Actually Live on Mars?	HS-ESS1-2, HS-ETS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
09	L1	Why Your Phone Battery Dies So Fast	HS-PS3-1, HS-PS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
09	L1	The Ocean Is Turning to Acid	HS-ESS3-6, HS-PS1-7	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11, FS9.1	✓
09	L1	Why Some People Can't Drink Milk	HS-LS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1	✓
09	L1	How Social Media Hacks Your Brain	HS-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
09	L1	Fast Fashion Is Killing the Planet	HS-ESS3-4, HS-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
09	L1	Why Earthquakes Hit Some Cities Harder	HS-ESS2-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
09	L1	The Wildfire Feedback Loop	HS-ESS3-3, HS-LS2-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 09 — L2

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
09	L2	The Antibiotic Resistance Arms Race	HS-LS4-2, HS-LS4-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1	✓
09	L2	Climate Tipping Points: The Point of No Return	HS-ESS3-5, HS-ESS2-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
09	L2	Why Pandemics Go Exponential	HS-LS2-6, HS-ETS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
09	L2	The Opioid Epidemic: When Medicine Becomes the Disease	HS-LS1-2, HS-ETS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS3, FS9.1	✓
09	L2	Coral Reef Collapse: Death of an Underwater City	HS-LS2-6, HS-ESS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
09	L2	The Water-Energy-Food Nexus: Three Crises, One System	HS-ESS3-4, HS-ETS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
09	L2	Urban Heat Islands: Why Cities Are Hotter Than Forests	HS-ESS3-4, HS-PS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11, FS9.1	✓
09	L2	CRISPR Gene Drives: Rewriting Evolution	HS-LS3-1, HS-LS4-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2.2, FS1.3, FS11	
09	L2	Microplastics in the Food Chain: The Invisible Invasion	HS-LS2-6, HS-ESS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
09	L2	Renewable Energy Grid Optimization: Powering the Future	HS-PS3-3, HS-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 09 — L3

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
09	L3	Designing a Cancer Drug That Actually Works	HS-LS1-4, HS-ETS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11	✓
09	L3	Engineering a Superbug Killer	HS-LS1-2, HS-LS4-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1	✓
09	L3	CRISPR Gene Drive: Should We Eliminate Malaria?	HS-LS3-2, HS-LS4-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2.2, FS1.3, FS11	
09	L3	Growing Meat Without the Animal	HS-LS1-2, HS-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
09	L3	Predicting the Next Pandemic	HS-LS2-6, HS-ETS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS3, FS7.1	✓
09	L3	Designing Organisms That Eat Plastic	HS-LS1-5, HS-ETS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	✓
09	L3	Metabolic Engineering for Biofuels	HS-LS1-5, HS-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
09	L3	Gene Regulatory Networks	HS-LS3-1, HS-LS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	
09	L3	Vaccine Design Optimization	HS-LS1-4, HS-LS4-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1	✓
09	L3	Climate-Ecosystem Coupled Models	HS-ESS3-5, HS-LS2-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Grade 10 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
10	L1	Why Do Fireworks Explode in Different Colors?	HS-PS1-1, HS-PS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L1	Can Nuclear Power Actually Save the Planet?	HS-PS1-8, HS-ESS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L1	Why Do Roller Coasters Make You Scream?	HS-PS2-1, HS-PS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L1	How Does Your Phone Fit 10,000 Songs?	HS-PS4-5, HS-ETS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L1	Why Are You Taller Than Your Grandparents?	HS-LS3-2, HS-LS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS9.1	✓
10	L1	What Happens When Wolves Disappear?	HS-LS2-1, HS-LS2-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
10	L1	Why Can't Weather Apps Get It Right?	HS-ESS2-5, HS-ESS2-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L1	How Do We Know the Earth Is 4.5 Billion Years Old?	HS-ESS1-5, HS-ESS1-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L1	Why Do Magnets Work Through Your Phone Case?	HS-PS2-3, HS-PS3-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L1	Why Can't Humans Photosynthesize?	HS-LS1-7, HS-LS2-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	✓

8 Alignment Table: Grade 10 — L2

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
10	L2	Why Is Lithium the New Gold?	HS-ESS3-1, HS-PS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L2	How Do Stars Forge Every Atom in Your Body?	HS-ESS1-3, HS-PS1-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
10	L2	The Carbon Bomb: Why Thawing Permafrost Terrifies Scientists	HS-ESS2-6, HS-LS2-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L2	Can We Engineer the Amazon Back to Life?	HS-LS2-7, HS-ESS2-7	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L2	Why Did Dinosaurs Rule and Then Vanish?	HS-LS4-1, HS-LS4-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L2	How Does 5G Actually Work?	HS-PS4-2, HS-PS4-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L2	Why Does a Glow Stick Stop Glowing?	HS-PS1-4, HS-PS1-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L2	The Nitrogen Crisis: Why Fertilizer Is Destroying Our Rivers	HS-LS2-4, HS-ESS2-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L2	How Do Doctors See Inside You Without Cutting You Open?	HS-PS2-4, HS-PS4-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L2	Why Do Animals Migrate Thousands of Miles?	HS-LS2-8, HS-LS4-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓

8 Alignment Table: Grade 10 — L3

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
10	L3	Designing a Mars Habitat That Won't Kill You	HS-ESS1-4, HS-ETS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
10	L3	Building a Star on Earth: The Fusion Energy Challenge	HS-ESS1-1, HS-PS3-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L3	Quantum Computing: Why 0 and 1 Aren't Enough	HS-PS4-3, HS-PS2-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L3	Carbon Capture at Scale: Can We Vacuum the Atmosphere?	HS-ESS2-6, HS-PS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L3	Engineering Earthquake-Proof Skyscrapers	HS-ESS2-2, HS-PS2-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L3	How Self-Driving Cars See the Road	HS-PS4-2, HS-PS4-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L3	Designing the Perfect Artificial Organ	HS-LS1-6, HS-PS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11, FS7.1	✓
10	L3	Can the Ocean Power Entire Cities?	HS-PS3-2, HS-ESS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
10	L3	De-Extinction: Should We Bring Back the Woolly Mammoth?	HS-LS4-4, HS-LS2-7	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.2.2, FS1.3, FS11	✓
10	L3	Building a Space Elevator: The Ultimate Engineering Challenge	HS-PS2-2, HS-PS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓

8 Alignment Table: Grade 11 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
11	L1	Why Is Your Phone Designed to Be Addictive?	HS-LS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L1	Can We Actually Feed 10 Billion People?	HS-LS2-1, HS-ESS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
11	L1	Why Do Some Neighborhoods Flood While Others Don't?	HS-ESS3-4, HS-ETS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L1	How Does Your Immune System Learn?	HS-LS1-2, HS-LS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1	✓
11	L1	Is Fast Fashion Destroying the Planet?	HS-ESS3-2, HS-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L1	Can an Algorithm Be Racist?	HS-ETS1-1, HS-ETS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L1	Why Do Bridges Collapse?	HS-PS2-1, HS-ETS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L1	How Do Noise-Canceling Headphones Work?	HS-PS4-1, HS-PS4-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	✓
11	L1	Could We Actually Mine Asteroids?	HS-ESS1-4, HS-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L1	Why Do Pandemics Spiral Out of Control?	HS-LS2-2, HS-LS4-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS7.1	

8 Alignment Table: Grade 11 — L2

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
11	L2	The Ocean's Silent Emergency	HS-ESS2-6, HS-LS2-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
11	L2	Can Cities Run on 100% Clean Energy?	HS-PS3-3, HS-ESS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L2	The Coral Reef Death Spiral	HS-LS2-2, HS-LS2-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L2	When Permafrost Melts, What Wakes Up?	HS-ESS2-4, HS-ESS2-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L2	Can We Reverse Deforestation Before It's Too Late?	HS-LS2-4, HS-ESS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L2	Why Is Clean Water Becoming Scarce?	HS-ESS2-5, HS-ESS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
11	L2	The Plastic Paradox	HS-ESS3-4, HS-LS2-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11, FS9.1	✓
11	L2	Can Soil Save the Climate?	HS-LS2-4, HS-ESS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	✓
11	L2	Why Do Invasive Species Win?	HS-LS2-2, HS-LS2-6, HS-LS4-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L2	The Heat Island Effect	HS-ESS3-4, HS-ETS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11, FS9.1	✓

8 Alignment Table: Grade 11 — L3

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
11	L3	Can CRISPR Cure Genetic Diseases?	HS-LS3-1, HS-LS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2.2, FS1.3, FS11	✓
11	L3	The Quantum Computing Revolution	HS-PS4-3, HS-PS4-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L3	Can We Build a Fusion Reactor?	HS-PS1-8, HS-PS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L3	How Does a Neural Network Learn?	HS-ETS1-1, HS-ETS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L3	Can Synthetic Biology Create New Life?	HS-LS1-1, HS-LS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L3	Can We Capture Carbon from Thin Air?	HS-ESS3-4, HS-PS1-4, HS-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L3	How Do Self-Driving Cars See?	HS-PS4-1, HS-ETS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
11	L3	Can We 3D-Print a Human Organ?	HS-LS1-2, HS-ETS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11, FS7.1	✓
11	L3	Can Nanotechnology Deliver Medicine to Individual Cells?	HS-LS1-3, HS-PS2-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1	✓
11	L3	Will Brain-Computer Interfaces Change Humanity?	HS-LS1-2, HS-LS1-3, HS-ETS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓

8 Alignment Table: Grade 12 — L1

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
12	L1	Why Does Your Brain Lie to You?	HS-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
12	L1	The Science of Sleep: Why Teens Can't Wake Up	HS-LS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
12	L1	Is Your Tap Water Safe?	HS-PS1-2, HS-ESS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L1	The Ultra-Processed Food Problem	HS-LS1-7	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
12	L1	Why Some People Get Addicted and Others Don't	HS-LS1-2, HS-LS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
12	L1	Why Is Antibiotic Resistance Getting Worse?	HS-LS4-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1	✓
12	L1	Can We Edit the Human Genome?	HS-LS3-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	
12	L1	Why Does Stress Make You Sick?	HS-LS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1, FS9.1	✓
12	L1	Is Social Media Rewiring Your Brain?	HS-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
12	L1	How Can One Mutation Change Everything?	HS-LS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	

8 Alignment Table: Grade 12 — L2

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
12	L2	Is Climate Change Reversible?	HS-ESS3-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L2	Why Are Coral Reefs Dying?	HS-LS2-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L2	Can We Feed 10 Billion People?	HS-LS2-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
12	L2	Where Does All the Plastic Go?	HS-ESS3-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
12	L2	Why Are Species Going Extinct So Fast?	HS-LS2-7	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L2	Can Renewable Energy Replace Fossil Fuels?	HS-ESS3-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L2	Is Our Freshwater Running Out?	HS-ESS2-5	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L2	How Do Wildfires Reshape Ecosystems?	HS-LS2-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11, FS9.1	✓
12	L2	Can We Engineer the Climate?	HS-ESS2-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L2	Why Do Environmental Inequities Exist?	HS-ESS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11, FS9.1	✓

8 Alignment Table: Grade 12 — L3

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
12	L3	Can We Colonize Mars?	HS-ESS2-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
12	L3	How Do Pandemics Spread?	HS-LS2-8	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1	✓
12	L3	Can AI Become Conscious?	HS-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L3	How Do We Build a Sustainable City?	HS-ESS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L3	Can We Cure Cancer?	HS-LS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.3, FS11, FS7.1	✓
12	L3	How Does the Brain Create Consciousness?	HS-LS1-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
12	L3	Can We Reverse Aging?	HS-LS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.2, FS1.2.2, FS1.3, FS11, FS9.1	✓
12	L3	How Do Ecosystems Recover from Catastrophe?	HS-LS2-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L3	Can Nuclear Fusion Power the World?	HS-PS1-8	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
12	L3	What Defines the Ethics of Science?	HS-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Nature's Engineers (Special Series)

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
NE	L1	Does More Beavers Mean a Bigger Dam?	3-LS4-3, 3-LS4-4, 3-5-ETS1-1	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
NE	L1	Can a Robot Swim Like a Beaver?	4-LS1-1, 3-5-ETS1-1, 3-5-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
NE	L1	Sponge vs. Pavement	MS-ESS2-4, MS-ESS3-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
NE	L1	Telephone Game — How Signals Travel	MS-LS1-8, MS-PS4-2	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
NE	L1	One Species Changes Everything	MS-LS2-4, HS-LS2-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.2, FS1.3, FS11, FS9.1	✓
NE	L1	Should We or Shouldn't We?	HS-ETS1-1, HS-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	

8 Alignment Table: Nature's Engineers (Special Series)

Grade	Level	Lesson Title	NGSS PE	ISTE	Biotech Skills (1-10)	NCHSE	CA HE
NE	L2	Ecosystem Engineers	5-LS2-1, 5-ESS2-1, 3-5-ETS1-3	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
NE	L2	Biomimicry Design Lab	MS-LS4-4, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
NE	L2	Ecohydrology — Fire-Resistant Landscapes	MS-ESS2-4, MS-ESS3-3, MS-ESS3-4, MS-LS2-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11, FS9.1	✓
NE	L2	The Brain-Machine Connection	MS-LS1-8, HS-LS1-2, HS-ETS1-2, HS-ETS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.1, FS1.3, FS11	✓
NE	L2	Restoring Ecosystems — Data-Driven Recovery	HS-LS2-6, HS-LS2-7, HS-ESS3-3, HS-ESS3-4, HS-ETS1-4	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	
NE	L2	AI, Robotics & Ethics — Modeling Hard Choices	HS-ETS1-1, HS-ETS1-3, HS-LS2-7, HS-LS4-6	3d, 4a, 4b, 4c, 4d, 5a, 5b, 5c, 5d, 6c	●●●● ●● ●● ● ●	FS1.3, FS11	