Contents

	Unit I — Biome	edical Research	
	Contents	Activity Type	Page
Unit I-Chapter 1	What is Science?		
	What is Science? What is Science? Great "Truths" What is a Scientist? Super Scientists Some Biological Scientists, Their Discoveries and Trends How Observant are You? Think Creatively! Who Weaves the Fabric of Science	Reference Handout Lesson Plan Lesson Plan Handouts Lesson Plan Lesson Plan Lesson Plan	1.3 1.7 1.9 1.10 1.11 1.14 1.16
Unit I-Chapter 2	What is Biomedical Research? What is Biomedical Research? What is Basic Biomedical Resear Basic Heart Facts Heart Throbs Effects of Food and Exercise What is Applied Research? What is Clinical Research?	Teacher's Notes rch? Reference Handout Lesson Plan/Handout Lesson Plan/Handout Reference	

Acknowledgments xii

Unit I — Biomedical Research

(continued)

Unit I-Chapter 3

Contents	Activity Type	Page
Biomedical Research Methods		
Biomedical Research Methods	Teacher's Notes	3.1
Biomedical Research Methods	Handout	. 3.3
Chemical, Mechanical and		
Mathematical Models	Reference	. 3.4
In Vitro Studies	Reference	. 3.6
Nonhuman Animal Models	Reference	. 3.8
The Heart Stopper	Lesson Plan/Handout	3.11
Itchy Sleep Disease	Lesson Plan	3.15
Human Clinical Trials	Reference	3.17
Human Clinical Studies	Lesson Plan	3.20
Clinical Studies	Handout	3.21
Epidemiological Studies	Reference	3.23
Disease Modeling	Lesson Plan/Handout	3.27
Cholera and the Scientific Method	Lesson Plan	3.30
"Cholera Victims" Cholera and the		
Scientific Method	Handout	3.35
"Investigators" Cholera and the		
Scientific Method	Handout	3.36
Who Can Cure Our Mystery Disease?	Lesson Plan	3.37
You Choose the Test!	Lesson Plan/Handout	3 40

Unit II — Care and Use of Animals in Biomedical Research

	Contents	Activity Type	Page
Unit I-Chapter 4	Benefits of Biomedical Resear	ch	
	Benefits of Biomedical Research	Teacher's Notes	4.1
	Team IDEA Webbing	Lesson Plan/Handout	4.4
	Did You or Will You Ever?	Lesson Plan/Handout	4.8
	What Difference Has Biomedical		
	Research Made to Human Health?	Reference	4.12
	Biomedical Research Advances	Handout	4.22
	Human Vaccines Developed		
	Through Biomedical Research	Handout	4.23
	What a Difference Biomedical		
	Research Makes	Lesson Plan/Handout	4.25
	Polio: A Success Story	Reference	4.36
	History of Polio	Reference	4.38
	AIDS: A Need for Continuing		
	Research	Reference	4.42
	The Continuing Search: AIDS Biomedical Research Advances	Lesson Plan/Handout	4.45
	That Benefit Animals	Handout	4.53
	Biomedical Research for		
	Animal Health	Reference	4.54
Unit II-Chapter 1	Student Surveys		
	Student Surveys	Teacher's Notes	1.1
	Pre-Survey: The Use of Animals in	Y D1 /YY 1	
	Biomedical Research		
	Student Attitude Survey	Lesson Plan/Handout	1.5

Unit II — Care and Use of Animals in Biomedical Research

	Contents	Activity Type	Page
Unit II-Chapter 2	Why Use Animals?		
	Why Use Animals?	Teacher's Notes	. 2.1
	Why Use Animals?	Reference	. 2.2
	Use of Animals in Biomedical	Y 201 //Y 1	2.4
	Research		
	Animal Pictures	Handout	. 2.6
	Use of Animals in Biomedical		
	Research —	D 0	
	Teacher's Guide		
	Most Commonly Used Animal Models	Reference	. 2.8
	Animals Studied for Their Unique	D 0	• •
	Characteristics	Reference	. 2.9
Unit II-Chapter 3	Advances Based on Animal Rese	arch	
	Advances Based on Animal Research	Teacher's Notes	. 3.1
	Research Animals Used to Make		
	Some Major Medical Advances	Handout	. 3.3
	Without Animal Research	Reference	. 3.4
	Research Partners	Reference	. 3.7
	Milestones in Biomedical Research		
	Benefiting Humans and Animals	Handout	3.12
	Human and Animal Health		
	Have Come a Long Way	Lesson Plan	3.17
Unit II-Chapter 4	Number and Species of Animals	Used	
	Number and Species of Animals Used	Teacher's Notes	. 4.1
	Number and Species of Animals Used		
	in Biomedical Research	Reference	4.2
	Become an Expert	Lesson Plan	4.5

Unit II — Care and Use of Animals in Biomedical Research (continued)

	Contents	Activity Type	Page
Unit II-Chapter 5	Care of Research Animals		
	Care of Research Animals	Teacher's Notes	5.1
	Caring for Research Animals Laws, Regulations and Guideline		5.2
	_	Reference	5.4
		e. Handout	5.8
		Lesson Plan	5.10
		Handout	5.12
		Lesson Plan	5.14
	Unit III — Chal	llenges to Biome	edical
	Research	-	
Unit III-	Critical Thinking		
Chapter 1	Critical Thinking	Teacher's Notes	1.1
	What Do You Believe?		
	What's Fact? What's Opinion? Biomedical Research and the	Lesson Plan	1.8
	1	Lesson Plan	1.10
	Sample Headlines		
	The Role of Animals in Society		
	Are You Affected?	Lesson Plan	1.16
	Communicating Scientific Facts:		
	GMOs and You	Lesson Plan/Handout	1.18

Unit III — Challenges to Biomedical Research (continued)

	Contents	Activity Type	Page
Unit III-	Animal Research: Issues and An	nswers	
Chapter 2	Animal Research: Issues and Answers	Teacher's Notes	2.1
	Animal Research vs. Animal Rights	Reference	2.3
	Issues and Answers	Reference	2.12
	Science and Self-Doubt	Reference	2.25
	Public Opinion Poll: American Beliefs	Reference	2.35
	Case Studies in Bioethics:		
	Animal Research vs. Animal Rights	Lesson Plan/Handout	2.36
	Case Studies in Trust of the Scientific		
	Method: Are Vaccines Safe?	Lesson Plan/Handout	2.40
Unit III-	Transgenic Animals		
Chapter 3	Transgenic Animals	Teacher's Notes	3.1
	Transgenic Animals	Reference	3.2
	Changing Animal Models	Lesson Plan/Handout	3.9
Unit III-	Therapeutic vs. Reproductive C	loning: Scientific Realities.	
Chapter 4	Public Controversy	g	
	Therapeutic vs. Reproductive		
	Cloning: Scientific Realities,		
	Public Controversy	Teacher's Notes	4.1
	Therapeutic vs. Reproductive Cloning:		
	Scientific Realities, Public		
	Controversy	Reference	4.2
	Bioethical Debate	Lesson Plan	4.9
	A Forum on Human Cloning	Handout	4.10
	Unit IV — Other I	ssues in Science	
Unit IV-	Careers in the Biosciences		
Chapter 1	Careers in the Biosciences	Teacher's Notes	1.1
	Becoming a Bioscientist		
	Curiosity is the Key to Discovery		
	Bioscience Careers		
	Looking Ahead: Careers		
	Job Hunting in the Biosciences		
	Resources	Reference	1.24

Unit IV — **Other Issues in Science**

(continued)

Unit IV-Chapter 2

Contents	Activity Type Pag	e
Genetics Primer		
Genetics Primer	Teacher's Notes	1
It's All in the Genes	Handout	3
Mendel's Rules — Dominant and		
Recessive Genes	Lesson Plan/Handout 2.17	7
Extracting DNA	Lesson Plan/Handout 2.25	5
Resources	Reference 2.28	3
Editing Life's Instructions	Reference 2.31	1
CRISPR — A Tool to Edit		
Life's Instructions	Reference 2.32	2
Virtual Fieldtrip — Explore		
CRISPR and Sickle Cell	Lesson Plan/Handout 2.44	1
Explore CRISPR Steps with		
CRISPR Associated Proteins		
and CRISPR 3D	Lesson Plan 2.47	7
Visualizing CRISPR	Lesson Plan/Handout 2.49)
CRISPR: What Could A Tree Be?	Lesson Plan 2.53	3
Nanobiotechnology		
Nanobiotechnology	Teacher's Notes 3.1	1
Nanobiotechnology		
How Big or is it How Small?		
Tools and Techniques for the		
1	Lesson Plan/Handout 3.23	3
Nanomanufacturing		
The Ethics of Nanotechnology		
Nanotechnology Reading		

Unit IV-Chapter 3

Unit IV — Other Issues in Science

(continued)

	Contents	Activity Type	Page
Unit IV-	Regenerative Medicine		
Chapter 4	Regenerative Medicine	Teacher's Notes	4.1
	Regenerative Medicine	Reference	4.3
	Discover the Scaffolding of Tissue		
	Building Better Tissue		
	Stem Cells Are All the Same		
	Aren't They?	Lesson Plan/Handout	4.25
	Regenerative Medicine:		
	Changing Life.	Lesson Plan/Handout	4.34
Unit IV-	New Technologies in Vaccines		
Chapter 5	New Technologies in Vaccines	Teacher's Notes	5.1
	New Technologies in Vaccines		
	Why Vaccines?		
	Population Changes		
	Culturing Cells		
	Plant-Based Vaccines: Coming to		
	a Disease Near You	Lesson Plan/Handout	5.46
	Will this Vaccine Work?		

Additional Resources

Contents	Activity Type	
About This Section	Teacher's Notes	1
Further Reading	Reference	2