

Table of Contents

STEM Awareness and Exploration	1-18
---	------

References	19-20
------------------	-------

Challenges

Before You Begin	22
------------------------	----

Challenge Components Overview	23-24
-------------------------------------	-------

Part 1: Matter & Energy **25** |

Challenge 1: Portable Power	27-36
--	--------------

Design Challenge Card	37
-----------------------------	----

Career Connections.....	39
-------------------------	----

Location Cards.....	41
---------------------	----

Challenge 2: Mystery Message	43-55
---	--------------

Design Challenge Card	57
-----------------------------	----

Career Connections.....	59
-------------------------	----

Challenge 3: Atomic Art	61-71
--------------------------------------	--------------

Design Challenge Card	73
-----------------------------	----

Career Connections.....	75
-------------------------	----

Atomic Art Planning Page	77
--------------------------------	----

Part 2: Force, Motion, & Energy **79** |

Challenge 4: Dangerous Delivery	81-91
--	--------------

Design Challenge Card	93
-----------------------------	----

Career Connections.....	95
-------------------------	----

Challenge 5: Building Better Bones	97-109
---	---------------

Design Challenge Card	111
-----------------------------	-----

Career Connections.....	113
-------------------------	-----

Challenge 6: Slingshot Safety	115-127
--	----------------

Design Challenge Card	129
-----------------------------	-----

Career Connections.....	131
-------------------------	-----

Table of Contents

Challenges

Part 3: Earth & Space	133
Challenge 7: Shielding Satellites	135-147
Design Challenge Card	149
Career Connections.....	151
Challenge 8: Fighting Floods	153-163
Design Challenge Card	165
Career Connections.....	167
Challenge 9: Withstanding Wind	169-181
Design Challenge Card	183
Career Connections.....	185
Tower Materials Price List.....	187
Budget	189
Tower Competition Score Sheet.....	191-193
Part 4: Organisms & Environments	195
Challenge 10: Classifying Kingdoms	197-209
Design Challenge Card	211
Career Connections.....	213
Computational Thinking Guide	215
Organism Classification Cards.....	217-218
Challenge 11: Helpful Habitats	219-229
Design Challenge Card	231
Career Connections.....	233
Migratory Birds Habitat Planner	235
Migratory Birds Information Cards.....	237-243
Challenge 12: River Rubbish Removal	245-257
Design Challenge Card	259
Career Connections.....	261

Table of Contents

Appendix

STEM Fluency Skills	263
Create a Culture of Critical Thinkers.....	263
Encourage Creative Problem Solving	264
Build Collaborative Classrooms.....	265
Encourage Student Communication	266
Foster Resilient Learners	267
Glossary of STEM Careers	268-271
Building Consensus	272
Student Roles	273-277
Engineering Design Notebook	279
Engineering Design Notebook Checklist	280
Rubrics	281
Challenge Rubric.....	283
Engineering Design Process (EDP) Rubric	285
STEM Skills Rubric	287-291
STEM Classroom	293
Writing a STEM Challenge	294-295
Facilitation Questions and Sentence Stems in the EDP	
Quick Reference Guide.....	297-298
Feedback Sentence Stems	299
Computational Thinking Guide	301
Using a Budget	303
Materials Price List.....	305
Team Budget Page	307
Recycling Posters	309-313