

Contents

Aerodynamic Forces.....	11
1.1 Introductory Discussion	11
1.2 Exercises	11
1.2.1 Exercise A.....	11
1.2.2 Exercise B–Vocabulary	13
1.2.3 Exercise C–Translation	14
1.3 Why an Aircraft Flies.....	15
1.3.1 Exercise A: Comprehension.....	17
1.3.2 Exercise B: Vocabulary	18
1.3.3 Exercise C: Fill in the Blanks	19
1.3.4 Exercise D: Writing	20
1.4 How Does an Aircraft Really Fly?.....	21
1.4.1 Exercise A: Diagram	22
1.4.2 Exercise B: Discussion Questions	22
1.4.3 Language Corrections	22
1.5 James Bond 007–Reading Numbers Aloud in English	24
1.5.1 Multiple Digits	24
1.5.2 Zero	25
1.5.3 The Decimal Point	26
1.5.4 Plural Forms and False Friends	26
1.5.5 Dates	27
1.5.6 Fractions	27
1.5.7 Percent	28
 Wings and Airfoils.....	 29
2.1 Geometry Definitions.....	29
2.1.1 Exercise A: Basic Vocabulary	29
2.1.2 Exercise B: Further Terminology	30
2.1.3 Exercise C: Swept Wings	31
2.2 The Secret Behind Mini-TEDs: Novel Aerodynamic Wing Flaps.....	31
2.2.1 Exercise A: Comprehension Questions.....	33
2.2.2 Exercise B: Technical Vocabulary	34
2.2.3 Exercise C: Academic Vocabulary.....	35
2.2.4 Exercise D: Group Work	36
2.3 Reading Mathematical Equations Aloud	37
2.3.1 Basic Arithmetic Operations	37

2.3.2	Superscripts and Subscripts	37
2.3.3	Roots	38
2.3.4	Brackets	38
2.4	Exercises	39
2.4.1	Further Mathematical Symbols.....	39
2.4.2	Further Practice.....	40
Aircraft Motion		41
3.1	Pitch Motion.....	41
3.2	Roll Motion	42
3.3	Yaw Motion.....	43
3.4	Trim Systems	44
3.4.1	Comprehension Questions	48
3.4.2	Vocabulary	49
3.5	Mathematical Symbols and Formulae	50
Propulsion Systems.....		51
4.1	Propeller Propulsion	51
4.2	Gas Turbine Propulsion	54
4.3	Ramjet Propulsion	55
4.4	Rocket Propulsion.....	57
4.5	Paraphrasing.....	59
4.6	Jet Engines.....	60
4.7	Shapes.....	61
4.8	Geometry.....	62
4.8.1	Exercise A.....	62
4.8.2	Exercise B.....	63
Composite Materials		64
5.1	Vocabulary.....	64
5.2	Composite Materials	65
5.2.1	Background Information	65
5.2.2	Discussion Questions	65
5.3	Common Chemical Elements from the Periodic Table	67
Helicopters		69
6.1	How Helicopters Work.....	69
6.1.1	Exercise A: Comprehension Questions.....	72
6.1.2	Exercise B: Vocabulary Questions.....	73
6.1.3	Exercise C: Words of Motion.....	74
6.1.4	Exercise D: Translation.....	75
6.2	Describing the Movement of a Graph	76
6.2.1	Exercises.....	79

6.3	Agreeing and Disagreeing.....	79
6.3.1	Text: Helicopter with Flapping Rotors.....	80
6.3.2	Writing.....	81

The Future of NASA 82

7.1	NASA's Vision.....	82
7.2	The Shuttle Program.....	84
7.3	Delayed Discovery Launch.....	86
7.3.1	Vocabulary Exercise.....	86
7.3.2	Audiotext: Delayed Discovery Launch.....	87
7.4	Ares Program.....	90
7.4.1	Introductory Text.....	90
7.4.2	After the Shuttle (Summary).....	91
7.5	False Friends.....	93

Space Elevators..... 94

8.1	Satellites on a Leash.....	94
8.1.1	Vocabulary.....	96
8.1.2	Comprehension Questions.....	96
8.2	Summarizing/Paraphrasing/Clarifying.....	97
8.2.1	Text One.....	97
8.2.2	Text Two.....	98
8.3	Attending a Conference.....	99
8.3.1	Exercise A.....	99
8.3.2	Exercise B.....	100
8.4	Uncountable Nouns.....	101

Electrical Rocket Propulsion 102

9.1	Introduction to Electrical Rocket Propulsion.....	102
9.1.1	Vocabulary.....	105
9.1.2	Questions.....	106
9.2	Hall Effect Thrusters.....	107
9.2.1	Vocabulary.....	108
9.2.2	Comprehension Questions.....	109
9.3	Comparison of Propulsion Technologies.....	110
9.4	Discourse Markers.....	111

Orbits and SMART-1..... 113

10.1	SMART-1's Lunar Mission.....	113
10.2	Orbits.....	115
10.2.1	Preliminary Questions.....	115
10.2.2	Vocabulary.....	116
10.2.3	Comprehension Questions.....	116

10.2.4 A spiral pathway to the Moon.....	116
10.2.5 Translations	117
10.3 Ion Electric Propulsion on SMART-1	118
10.4 Clarifying Information	119
10.4.1 Speaking Exercise	120
10.4.2 SMART-1 mission overview.....	121
10.5 Cause and Effect.....	122
10.5.1 Exercise A.....	122
10.5.2 Exercise B.....	123
Commercial Space Flight.....	124
11.1 Preliminary Discussion Questions.....	124
11.2 Commercial Space Flight: Listening Comprehension.....	125
11.2.1 Exercise A.....	126
11.2.2 Exercise B.....	127
11.3 Translation: SpaceShipOne.....	130
11.4 Respectively/ <i>Beziehungsweise</i>	131
International Space Station.....	132
12.1 The International Space Station	132
12.1.1 Overview of International Space Station.....	132
12.1.2 Comprehension Questions	134
12.2 Ad Lib Elaboration: Zarya and Unity Modules.....	135
12.3 Systems Operations.....	138
12.3.1 Systems Operations of an ISS Module.....	138
12.3.2 System Operations of the Columbus Module.....	138
12.3.3 Collocations.....	139
12.4 <i>Auslautverhärtung</i> / Terminal Devoicing.....	140
Credits	141
Selected Reference List.....	144
Answer Key	146
Student's Lexicon.....	174