I. How Can I Use All or Parts of this Exercise in my Class?

(based on Project 2061 instructional materials design.)

	Part 3.1	Part 3.2	Part 3.3	Part 3.4	Part 3.5
Title (of each part)	What are Microfossils?	Microfossils in Deep Sea Sediment	Application of First & Last Occurrences	Sediment Accumulation Rates	Datum Reliability
How much class time will I need? (per part)	30-45 minutes	<30 minutes	~30 minutes, plus discussion time	<30 minutes	<30 minutes
Can this be done independently (i.e., as homework)?	Yes, but doing Part 3.1 in lecture works well	Yes, as homework, lab or discussion section	Yes, as homework, lab or discussion section	Yes, as homework, lab or discussion section	Yes, as homework, lab or discussion section
What content will students be introduced to in this exercise?					
Phyto- & zooplankton distributions, abundances & diversity	X	X	X	X	X
Geologic timescale and/or Geomagnetic polarity timescale	X		X	X	
Sea level change	X				
Trophic levels & productivity	X				
Age determination using fossils, index fossils, biozones, datums, first/last occurrences		X	X	X	X
Extinction		X	X	X	X
Sed accum rates, age-depth plots				X	X
Calibration & correlation of different types of data			X		X
Unconformities, hiatus				X	X
Reliability and uncertainty					X
What types of transportable skills will students practice in this exercise?					
Make observations (describe what you see)	X	X	X	X	X
Plot data, determine lines of best fit, interpret graphs, diagrams, photos, tables		X	X	X	X
Pose hypotheses or predictions	X	X	X	X	X
Perform calculations & develop quantitative skills				X	X
Decision-making, problem solving & pattern recognition	X	X	X	X	X
What general prerequisite knowledge & skills are required?	Basic biology and Earth science	Basic biology and Earth science	Basic biology and Earth science	Basic math and Earth science	Basic geography and Earth science
What Anchor Exercises (or Parts of Exercises) should be done prior to this to guide student interpretation & reasoning?	Ch. 2: Seafloor Sediments	Part 3.1	Parts 3.1-3.2	Parts 3.1-3.3	Parts 3.1-3.4

What other resources or materials do I need? (e.g., internet access to show on-line video; access to maps, colored pencils)	None	Access to world map or ocean floor map	None	None	Access to world map or ocean floor map
What student misconception does this exercise address?	Kingdoms of life; how productivity works	Evolution of life (first and last occurrences of organisms)	How relative age is assigned to (deep-sea) sediments	How age-depth plots are constructed	Dispersal of species; science is testable
What forms of data are used in this? (e.g., graphs, tables, photos, maps)	Photos, graphs	Photos, map, tables	Diagram, chart, tables	Tables, graph	Map, tables
What geographic locations are these datasets from?	N/A	Western equatorial Pacific, NW Pacific – Shatsky Rise	NW Pacific – Shatsky Rise, North Pacific Ocean	NW Pacific – Shatsky Rise, eastern equatorial Pacific	NW Pacific – Shatsky Rise, Caribbean Sea
How can I use this exercise to identify my students' prior knowledge (i.e., student misconceptions, commonly held beliefs)?	Prior knowledge and misconceptions can be identified by examining student answers of open ended questions and/or though class discussion. Student ideas on evolution, correlation, reliability will certainly be drawn out in this exercise.				
How can I encourage students to reflect on what they have learned in this exercise? [Formative Assessment]	Exercise Parts can be concluded by asking: *On note card (with or without name) to turn in, answer: What did you find most interesting/helpful in the exercise we did above? Does what we did model scientific practice? If so, how and if not, why not?*				
How can I assess student learning after they complete all or part of the exercise? [Summative Assessment]	See suggestions in Summative Assessment section below.				
Where can I go to for more information on the science in this exercise?	See the Supplemental Materials and Reference sections below.				