Lesson 1: Teacher Reference

Unit Materials Planning

In order to support students as they work with very large data sets, the printing needs of this unit may require more advance planning than other units do. We've listed here lessons with printing needs beyond typical copies of handouts so that you can plan ahead and have materials ready for students when they need them.

Note that if you have purchased a materials kit, it likely includes these materials for you, but this reference can be used to replace consumable, damaged, or lost items as needed.

Lesson	Special print items	Details (also found in each lesson's teacher guide)
1	*Data Cards for Modern Penguins and Pedro*	Print 1 set of *Data Cards for Modern Penguins and Pedro* for each group of 3 students in your largest class in color on cardstock. Cut into half-sheet cards. Consider laminating the cards for future use. If you cannot print in color, print the cards in grayscale for sorting and students can access a color version of the cards for reference in the student edition or digitally. Use a binder clip to keep each set of these together. These are nonconsumables that you collect and reuse in all classes.
2	*Data Strips: External Structures in Modern Penguins and Pedro*	Print enough *Data Strips: External Structures in Modern Penguins and Pedro* for half of your largest class. Cut out the strips. Secure each set with a binder clip. Consider laminating the strips since you will reuse them for each class you teach and can keep them year to year.
2	*Nonconsumable Lesson 2 Data Strips: Internal and External Structures in Modern Penguins and Pedro*	Print enough *Nonconsumable Lesson 2 Data Strips: Internal and External Structures in Modern Penguins and Pedro* for half of your largest class. Cut out the strips. Fold each strip in half so that the external structures and behavior data are on one side of the strip and internal data are on the other side of the strip. Secure each set with a binder clip. Consider laminating the strips since you will reuse them for each class you teach and can keep them year to year.
2	*External Structures and Behaviors Key*, *Internal Structures Key*	If your class is using the student editions, students will reference *External Structures and Behaviors Key* and *Internal Structures Key* during this lesson. If you do not have student editions, prepare these keys as nonconsumable handouts. Print one of each of the following for every student in your largest class: *Reference: External Structures and Behaviors Key* and *Reference: Internal Structures Key*. Consider printing these on cardstock and/or laminating them since you will reuse them for each class you teach and can keep them year to year.
2	*Penguin Stickers*	Print in color two sticker strips per student of Penguin Stickers onto ¾" x ¾" square labels using a zero-inch margin. Cut four vertical strips of stickers out of each letter-sized sheet. Each strip will contain 20 total (¾" x ¾") stickers: 19 different penguin (modern and Pedro) labels and one blank. Each student will use 1 of these strips on day 1 and 1 more of these strips on day 2 when they organize and annotate the patterns they see.
3	*Ancient Penguin Data Cards*	Print one color copy for every 3 students and then cut the copies into half-page cards. If possible, print on cardstock and/or laminate. Use a binder clip to keep each set of these together. If you cannot print in color, print the cards in grayscale for sorting and students can access a color version of the cards for reference in the student edition or digitally. Consider laminating these cards since you will reuse them for each class you teach and can keep them year to year.
3	*Maps of Earth's Surface Over the Last 50 Million Years*	Print and laminate one color copy of *Maps of Earth's Surface Over the Last 50 Million Years* per student in your largest class.

3	**Optional:** *Extension: Data strips for more-incomplete ancient penguin fossils*	**Optional:** Make a color copy of *Extension: Data strips for more-incomplete ancient penguin fossils* for each pair of students in your largest class. Cut the strips out of these and clip each set of strips together with a binder clip. Since these are supplementary material for students who are interested, it is recommended that you collect and reuse these for all your classes if you choose to selectively distribute them to groups that request them. Consider laminating these strips since you will reuse them for each class you teach and can keep them year to year.
3	*Data strips for ancient penguin fossils*; *Consumable Lesson 3 Data Strips: Internal and External Structures in Modern Penguins and Pedro*	Print black and white copies of *Data strips for ancient penguin fossils* and *Consumable Lesson 3 Data Strips: Internal and External Structures in Modern Penguins and Pedro* for every pair of students in every class. Decide if you think you will have time in class to have students cut their own strips at the start of the activity. If not, cut the strips ahead of time. After they are cut, use a binder clip to secure each set. Students will use these to build their poster.
3	*Timeline Sections*	Print one color copy of *Timeline Sections* for every 2 groups (of three) in your classes. Cut out the two identical sections from every sheet. Tape the three different sections of the color timeline together for each group. Students will be using these to build their poster.
3	*Reference: Internal Structures Key*	Print black and white copies of *Reference: Internal Structures Key* for every pair of students (which is how they are initially used). Students may wish to use these in the construction of their posters (which will be done in groups of 3 students), so this printing is treated as consumable.
5	*Day 1: Horseshoe Crab Data Cards*; *Day 1: Horse Data Cards*; *Day 1: Whale Data Cards*.	Print *Day 1: Horseshoe Crab Data Cards*, *Day 1: Horse Data Cards*, and *Day 1: Whale Data Cards* in color on cardstock, if available. If you cannot print in color, print the cards in grayscale for sorting and students can access a color version of the cards for reference in the student edition or digitally. Print sets of organism cards and their cover sheets from *Day 1: Horseshoe Crab Data Cards*, *Day 1: Horse Data Cards*, and *Day 1: Whale Data Cards*. Cut each set into half-sheet cards. Each set will have a cover sheet explaining common characteristics. You will need two or more sets for each organism (horseshoe crabs, horses, and whales): one set for each group that is working on that particular organism. Make enough sets for groups in your largest class. You may choose to laminate the cards. Clip the cover sheet and all cards for the same organism together in sets. These are nonconsumables that you will collect and reuse in all classes.
5	*Unknown material with identifier: ns.l5.ho4*; *Unknown material with identifier: ns.l5.ho5*; *Unknown material with identifier: ns.l5.ho6*	Print each of *Unknown material with identifier: ns.l5.ho4*, *Unknown material with identifier: ns.l5.ho5*, and *Unknown material with identifier: ns.l5.ho6* in color onto a letter-sized sheet of ¾" x ¾" square labels using a zero-inch margin. Print sufficient copies of *Unknown material with identifier: ns.l5.ho4*, *Unknown material with identifier: ns.l5.ho5*, and *Unknown material with identifier: ns.l5.ho6* so each student can have two sets of stickers. (Note that each student will need one set of stickers for their organism for this day 1 activity and one set of stickers for their organism for an activity on day 2 in this lesson. There are 8 sets of stickers per sheet, so each sheet is enough for 4 students). Cut sets of stickers from each sheet for easy distribution to students.
5	*Day 2: Horseshoe Crab Data Cards*; *Day 2: Horse Data Cards*; *Day 2: Whale Data Cards*	Print in color all data cards from *Day 2: Horseshoe Crab Data Cards*, *Day 2: Horse Data Cards*, and *Day 2: Whale Data Cards*. You will need two or more sets for each organism (horseshoe crabs, horses, and whales): one set for each group that will be working on that particular organism. If you cannot print in color, print the cards in grayscale for sorting and students can access a color version of the cards for reference in the student edition or digitally. Make enough sets for groups in your largest class. Cut each set into half-sheet cards. You may choose to laminate these cards, also. Clip the cover sheet and all cards for the same organism together in sets. These are non-consumables that you will collect and reuse in all classes.

5	*Maps of Earth's Surface 150 and 100 Million Years Ago*	Each group working with horseshoe crabs will need access to a copy of *Maps of Earth's Surface 150 and 100 Million Years Ago*, either in the student edition or as handouts which can be reused for all classes.
7	*Finch Data Packet*; *Peppered Moth Data Packet*; *Cliff Swallow Data Packet*; *Mustard Plant Data Packet*; *Stickleback Data Packet*	Print and staple sufficient copies of the case study data packets so every student in each case study group will have their own copy for that case (for example, every group of 5 students will need 5 copies of one of the following: *Finch Data Packet*, *Peppered Moth Data Packet*, *Cliff Swallow Data Packet*, *Mustard Plant Data Packet*, and *Stickleback Data Packet*.
7	*Finches Overview in Color*; *Peppered Moth Overview in Color*; *Cliff Swallow Overview in Color*; *Mustard Plant Overview in Color*; *Stickleback Overview in Color*	Prepare nonconsumable color overviews as follows: Print on cardstock one color Overview for each group working on that case. Consider laminating these pages since you will reuse them for each class you teach and in future lessons, and you can keep them year to year. You will reuse these color copies for all your classes. Each group will need one copy of the Overview for their assigned case. Note that this Overview is included in the data packet for each case so students can annotate a copy, but it will be printed in grayscale. This color copy allows them a clearer view of maps and other images. *Finches Overview in Color*, *Peppered Moth Overview in Color*, *Cliff Swallow Overview in Color*, *Mustard Plant Overview in Color*, and *Stickleback Overview in Color*.