STOP: COLMA SAND DUNES

DATE
and time

Wander around the sand dunes and answer these questions:

How tall and wide is the dune you see here behind and between houses? Estimate!

Collect some sand from these dunes (using vials that are provided). Label and describe as best as possible below:

These sand dunes sit atop the San Bruno Mountain Sandstone. How and when did these sand dunes develop here?

What unanswered questions do you have about the geology of this outcrop/rock/location?

STOP: SAN BRUNO MOUNTAIN

DATE
and time

During the walk around the top of San Bruno Mountain State Park, observe all the rock outcrops and collect a sample of all the different rock types you think you see. Share these with your smaller group and describe, name, and sketch them below. Describe and sketch any important features you see. (Include scale!)

Pick a vista looking northeast (assuming views are possible), and sketch the layout, labeling any features you know, such as mountain peaks, faults, bay, bridges, etc. See if you can imagine the underlying terrane map that cuts across the city of San Francisco. Include Scale!

Observation: looking along the road cut, are all sides equally weathered? Why or why not? If differences, describe below and give an explanation why.

Is every part of the outcrop equally resistant to weathering?

Observation: Sketch a section of the outcrop showing rock structures, types, and features. Label everthing and include a scale.

How well do you think this rock will handle an earthquake? Building upon? Why?

What unanswered questions do you have about the geology of this outcrop/rock/location?

STOP: INDIA BASIN SHORELINE

DATE
and time

Walk the shoreline around this park. Observe it carefully and the shorelines on opposite sides. Describe what you see these shorelines are made of. (Be sure to indicate if you see any differences around the shorelines that you can see.)

Pick one small portion of the India Basin Shoreline and sketch it below (20 feet by 20 feet). Show textures, fractures, etc. Label each rock type and feature. DON'T FORGET SCALE.

Compare this region to images/maps taken of the Bay prior to modern expansion. This region was not here then. Most of what you are standing on is modern fill. How stable do you think this area is in an earthquake? For building? Why or why not?

Follow instructor to the rocky oucrop below the bench. Carefully study these rocks and describe them below – texture, colors, hardness, etc. How can you tell that this is bedrock and not fill?

Sketch a portion of the outcrop below. Show textures, fractures, etc. Label each rock type and feature. DON'T FORGET SCALE. If you see any landslide or earth movement features, sketch and describe them as well.

Do you see any earth movement features or other interesting natural earth or human-induced earth movements or issues? Describe/sketch them below. Remember to provide scales for all sketches.

What unanswered questions do you have about the geology of this outcrop/rock/location?

STOP: TWIN PEAKS

DATE and time
Walk up and around the rock outcrop at the top of the hill and observe the different rocks and structures found. Draw and label the following three pictures with scales: 1) closeup of the layers (5 feet thick) 2) one larger structure and 3) standing below the hill and drawing the entire hill as best as possible. Label and describe all features.
What terrane are we observing?
How well do you think it handles building on it? Why?
Where else could we find and explore this terrane (nearby)?
What unanswered questions do you have about the geology of this outcrop/rock/location?

Walk up and around the rock outcrop at the top of the hill and observe the different rocks and structures found. Draw and label the following three pictures with scales: 1) closeup of the layers (5 feet thick) 2) one larger structure and 3) standing below the hill and drawing the entire hill as best as possible. Label and describe all features.

What terrane are we observing?

How well do you think it handles building on it? Why?

Where else could we find and
explore this terrane (nearby)?

What unanswered questions do you have about the geology of this outcrop/rock/location?

STOP: COIT TOWER

DATE
and time

Walk up and around the rock outcrop at the top of the hill and observe the different rocks and structures found. Draw and label the following three pictures with scales: 1) closeup of one nice rock sample within an outcrop (a few feet by a few feet) 2) distance sketch showing entire outcrop and 3) a crack of fault that you find in one of the cliff faces. Label and describe all features.

What terrane are we observing?

How well do you think it handles building on it? Why?

Where else could we find and explore this terrane (nearby)?

What unanswered questions do you have about the geology of this outcrop/rock/location?

STOP: FORT POINT

DATE
and time

Walk along the side of the road here at the base of the green hill – explore the material that the hill is made of. Collect some samples from the base. Find areas where the hillside is failing.
Describe the material that makes up this hillside in as much detail as possible:

Sketch one section of the hillside with scale and detail.

What do you notice about the vegetation within this material? What does that do to the stability of the slope? Why?

This material is not great for building upon. Why not? Do you see any evidence of this? What does it look like?

What terrane are we observing?

Where else have we seen this same terrane as we've traveled across the city?

What unanswered questions do you have about the geology of this outcrop/rock/location?

STOP : SUTRO BATHS

DATE
and time

Walk up to the top of this hillside and explore the material that the hill is made of. Describe the material that makes up this hillside in as much detail as possible:

Sketch an outcrop at the top of the hillside with scale and detail:

What terrane are we observing?

Where else did we see this terrane on the field trips so far?

Where else have we seen these sands before on this field trip?

Collect some of the sand in a vial and describe it. Compare your description to earlier descriptions. How do they compare?

STOP: GRANDVIEW PARK

DATE
and time

Walk up to the top of this hillside and explore the material that the hill is made of. Describe the material that makes up this hillside in as much detail as possible:

Sketch an outcrop at the top of the hillside with scale and detail:

What terrane are we observing?

Where else did we see this terrane on the field trips so far?

Where else have we seen these sands before on this field trip?

Collect some of the sand in a vial and describe it. Compare your description to earlier descriptions. How do they compare?

As we walk along 14th Street towards "The Rocks," explore these and how they may differ from those already seen. Find a particularly interesting structural section and sketch and describe it below (with scale!):

What unanswered questions do you have about the geology of this outcrop/rock/location?

STOP: MUSSEL ROCK

DATE
and time

As we head south, watch the cliff face. We're seeing very young layers of rocks left here over the past few million years as sea level has risen and fallen. Find a layer you think was laid down in the past when sea level was higher than is it today. Describe it below (thickness, texture, composition, etc.)

Find a layer you think was laid down in the past when sea level was lower than is it today. Describe it below (thickness, texture, composition, etc.)

Sketch a sectionof the cliff face that shows alternating layers. Show details. Label. And annotate with estimated sea level changes that correspond to these layers.

Look for fossils and structures (faults, cracks, landslides) in the cliffs and describe any you see below:

What unanswered questions do you have about the geology of this outcrop/rock/location?