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| **Grade 5** | **Lesson:**  **Landforms Part 2** | | Reference to English Interconnections Lesson  Shaping the land pg. 11 | |
| **Science Standard(s): Standard 2 Objective 1** | | | | |
| **Content Objective(s):** | | **Language Objective(s):** | | |
| Students will be able to demonstrate the affect of weathering and erosion on different landforms (a mesa, butte, canyon, cave and valley) over time by creating a model and describing its formation on an exit ticket independently.  ***I can show the affect of weathering and erosion on different landforms (such as a mesa, butte, canyon, cave and valley) over time by creating a model and explaining how I formed it on an exit ticket independently.***  我能说出风化和侵蚀随着时间的变化对不同地形的影响（比如平顶山，山丘，峡谷，洞穴和山谷），通过制作一个模型，并且独立的在退出卡上解释我是怎样做出来的。 | | Students will be able to explain how weathering and erosion change different landforms (a mesa, butte, canyon, cave and valley) over time by describing how they formed different landform models with a partner and small group.  ***I can explain how weathering and erosion change different landforms (such as a mesa, butte, canyon, cave and valley) over time by making different landform models and explaining how I formed them with a partner and small group.***  我能解释风化和侵蚀随着时间的变化是如何改变不同地形的（比如平顶山，山丘，峡谷，洞穴和山谷），通过制作不同的地形的模型，并且解释我是如何和一个同伴或者再小组中制作的。 | | |
| **Essential Questions:**  *How is the Earth’s surface changing over time?*  *地球的表面是如何随着时间的变化而改变的？* | | **Required Academic Vocabulary for Word Wall:**  **Listen:** geological, butte, mesa, canyon, cave, valley, landform, chemical processes  地质（学）的，山丘，平顶山，峡谷，洞穴，山谷，地形，化学作用  **Speak:** Weathering, Erosion, butte, mesa, canyon, cave, valley, rock layers, chemical weathering, limestone, minerals  风化，侵蚀，山丘，平顶山，峡谷，洞穴，山谷，岩石层，化学风化作用，石灰岩，矿产  **Read:** Weathering, Erosion, geological, butte, mesa, canyon, cave, valley  风化，侵蚀，地质（学）的，山丘，平顶山，峡谷，洞穴，山谷  **Write:**  Weathering, erosion, butte, mesa, canyon, cave, valley  风化，侵蚀，山丘，平顶山，峡谷，洞穴，山谷  **Sentence Frames:**  What landform did you create?  I created a \_\_\_\_\_\_.  How is a \_\_\_\_\_\_\_\_\_ formed?  A \_\_\_\_\_\_\_\_\_ is formed by weathering and erosion because \_\_\_\_\_\_.  你制作了什么地形？  我制作了\_\_\_\_\_\_。  \_\_\_\_\_\_\_是如何形成的呢？  \_\_\_\_\_\_\_是通过风化和侵蚀形成的因为\_\_\_\_\_\_。 | | |
| **Materials:**   * Land formation Vocabulary Cards * Modeling Clay or Model Magic—enough for each student to make small replicas of the different landforms. * Exit Tickets | | **Additional Lesson Vocabulary:**  Drainage, narrow, tectonic forces, microorganisms, atmospheric influences  排水系统，狭窄，构造力，微生物，大气作用 | | |
| **Lesson:** | | | | **Instructional Time: 40 Minutes** |
| **Opening:** **(5 minutes)**  **T: “I am going to hold up some pictures of some beautiful places you can find on Earth. They weren’t made out of clay or painted by the famous Michelangelo. They were made by Weathering and Erosion! Yet, I think most of you would agree that they could be considered art. When I post the picture on the document camera, I want you to stand up if you have actually seen these places before.”**  “我要拿一些可以在地球上找得到的地方的漂亮图片给你们看。它们不是用粘土做的，也不是著名的米开朗基罗的画。它们是由风化和侵蚀形成的！然而，我想你们大多数都会同意它们可以当作艺术品吧。当我把图片放到投影仪上的时候，如果曾经亲眼见过这些地方的同学请站起来。”   * Post the picture of the Butte. Let them clearly see the vocabulary word next to the picture as well.   **T: “This is a BUTTE near Sedona, Arizona. Don’t talk, but stand up if you have been there and seen this landform.”**  “这一幅是亚利桑那州的塞多纳附近的一个山丘。先别说话，如果你曾经去过见过这个地形请站起来。”   * Let them stand up quickly and then sit down again. Post the picture of the Grand Canyon.   **T: “This is The Grand Canyon in Arizona. Stand up if you have seen this landform.”**  “这一幅是亚利桑那的大峡谷。如果见过这个地形的请站起来。”   * Let them stand up quickly and then sit down again. Post the picture of the valley.   **T: “This is Little Cottonwood Creek Valley. It is in the Wasatch Mountains here in Utah! Stand up if you have been here. Most of you probably have!”**  “这一幅是小杨树溪谷。它就在犹他的瓦萨奇山脉！如果去过这里的请站起来。可能你们大多数都去过吧！”  **T: “All of these pictures show different landforms. And there are many more! The processes and forces of weathering and erosion change the surface of the Earth and create new and interesting shapes. They are what make the mountains, valleys, buttes, canyons and other geological formations we saw.”**  “这些图片都展示了不同的地形地貌。还有更多呢！风化和侵蚀的作用改变了地球的表面，创造出了新的、有趣的形状。就是它们创造出了我们所见到的山脉，山谷，山峰，峡谷和其他的地形地貌。”  **T: “Let’s take a look at our learning objective today.”** Point to the student objective ‘I can show the affect of weathering and erosion on different landforms (such as a mesa, butte, canyon, cave and valley) over time by creating a model and explaining how I formed it on an exit ticket independently.’ **“In your partnership, I want one of you to be partner 1 and one of you to be partner 2. Take 5 seconds to decide.”**  “让我们看一看我们今天的学习目标。” Point to the student objective‘我可以说出风化和侵蚀随着时间的变化对不同地形的影响（比如平顶山，山丘，峡谷，洞穴和山谷），通过制作一个模型，并且独立的在退出卡上解释我是怎样做出来的。  ’“在你们的小组中，我要你们一个做1号，一个做2号。5秒钟来决定。”  Students turn to their neighbors and decide who is partner 1 and who is partner 2. Then regain their attention.  **T: “Partner 2, when I say “go” you will ask your partner, ‘What are we going to do today?’” Write the question on the board. “Partner 1, you will read the objective on the board.”** Point to the objective. **“Then Partner 1, you will ask, ‘What is one thing we will learn today and how will we know we learned it?’”** Write the question on the board. **“Partner 2 will respond to the question by explaining one thing the class will learn today and how they will know they learned it. Let’s Practice.”**  “2号同学，当我说“开始”的时候，你们要问你们的同伴，‘你今天要做什么？’”把问题写在白板上。“1号同学，你们需要读出白板上的学习目标。” Point to the objective “然后1号同学，你们会问，‘今天我们学了什么，怎样才能知道我们学会了？’” Write the question on the board“2号同学要通过解释我们今天要学什么和怎么才能知道我们学会了来回答这个问题。让我们开始练习吧。”  *Use the Modeling Cycle:*  *Teacher Does:*   * Use a puppet, stuffed animal, or imaginary partner to use as your partner to model.   **T: “I am Partner 2 and my (puppet, stuffed animal, imaginary partner) is Partner 1. As Partner 2, I will ask, ‘What are we going to do today?’”** Point to the question on the board. **“My partner will say, ‘I can show the affect of weathering and erosion on different landforms (such as a mesa, butte, canyon, cave and valley) over time by creating a model and explaining how I formed it on an exit ticket independently.’ What is one thing we will learn today and how will we know we learned it?”** Point to the question on the board. **“As Partner 2 I will say something like, ‘We are going to show how weathering and erosion change landforms by making a model and explaining how we made it on an exit ticket by ourselves.’”**  “我是2号，我的（木偶，玩具，想象的同伴）是1号。作为2号，我将会问‘我们今天要学什么？’” Point to the question on the board.“我的同伴会说，‘我可以说出风化和侵蚀随着时间的变化对不同地形的影响（比如平顶山，山丘，峡谷，洞穴和山谷），通过制作一个模型，并且独立的在退出卡上解释我是怎样做出来的。我们今天学了什么，怎样才能知道我们学会了？” Point to the question on the board.“作为2号我会说，比如‘我们将会自己在退出卡上举出一个风化和侵蚀的例子并且解释它是怎么形成的。’”  *Teacher Does with Student****:***   * Select a student to come up and model with you.   **T: “I am Partner 2 and \_\_\_\_\_\_\_\_\_ is Partner 1. As Partner 2, I will ask, ‘What are we going to do today?’”** Point to the question on the board.  **“My partner will read the objective.**  “我是2号，\_\_\_\_\_是1号。作为2号，我将会问，‘我们今天要做什么？’” Point to the question on the board. “我的同伴将会读出学习目标。”  *S: We are going to show how weathering and erosion change landforms by making a model and explaining how we made it on an exit ticket by ourselves.*  “我们将会通过制作一个模型和独立的在退出卡上解释我们是怎样做的来展示风化和侵蚀是怎么改变地形的。”  **T: “Now my partner will ask this question.”** Point to the board.  “现在我的同伴要问我这个问题了。” Point to the board.  *S: What is one thing we will learn today and how will we know we learned it?*  “我们今天学了什么，怎样才能知道我们学会了？”  **T: “We are going to show how weathering and erosion change landforms by making a model and explaining how we made it on an exit ticket by ourselves.”**  “我们将会通过制作一个模型和独立的在退出卡上解释我们是怎样做的来展示风化和侵蚀是怎么改变地形的。”  *Two Students Do:*   * Select two students to come up and model with you.   **T: “Who would like to be Partner 2 and Partner 1? Take 5 seconds to decide.”**  “谁要当2号，谁要当1号？5秒钟来决定。”  Students decide who is Partner 2 and who is Partner 1.   * Point to the first question on the board.   *S1:* What are we going to do today?  “我们今天要做什么？”   * Point to the objective.   *S2: We are going to show how weathering and erosion change landforms by making a model and explaining how we made it on an exit ticket by ourselves.*  “我们将会通过制作一个模型和独立的在退出卡上解释我们是怎样做的来展示风化和侵蚀是怎么改变地形的。”   * Point to the other question on the board.   *S2: What is one thing we will learn today and how will we know we learned it?*  “我们今天学了什么，怎样才能知道我们学会了？”  *S1: We are going to show how weathering and erosion change landforms by making a model and explaining how we made it on an exit ticket by ourselves.*  “我们将会通过制作一个模型和独立的在退出卡上解释我们是怎样做的来展示风化和侵蚀是怎么改变地形的。”  *All Students Practice:*   * Give the class 1-2 minutes.   **Introduction to New Material (Direct Instruction): (15 minutes)**   * Pass out a small amount of model magic clay to each student.   **T: “Please do not touch this science tool until I say, ‘Go!’ If you decide to touch it, I will have to hold it for you and you will not be able to use if for the lesson. Today we are going to look at how some different landforms are shaped by weathering and erosion.”**  “我们有说‘开始’前，请不要碰这个工具！如果你决定要碰，我就会把它拿走，你就这节课就不能再用了。今天我们将要学习不同地形地貌是怎样通过风化和侵蚀形成的。”   * Post the picture of the mesa again.   **T: “This is Tucumcari Mountain. It is a MESA in New Mexico. A mesa is a flat-topped mountain bordered on all sides by steep cliffs. There are many different types of rock. Some erode quickly and some slowly. This is what gives mesas their distinctive shape. Softer rocks are eroded away on the surface into valleys, where they collect water drainage from the surrounding area, while the stronger rock layers are left standing out.** **A large area of strong rock may shield the layers below it from erosion while the softer rock surrounding it is eroded into valleys, thus forming a cap rock.”**  “这是图克姆卡里山。它是新墨西哥州的一个平顶山。平顶山是山顶平坦但是四周都是陡峭的悬崖的山。有不同种类的岩石。有一些被侵蚀的很快，有一些则很慢。这就是为什么平顶山有如此独特的形状。表面软一些的石头很快就被侵蚀进入山谷中了，就这样被附近的排水系统吸收了，然而硬一些的石头仍然挺立。大片的坚硬岩石也会保护包在里面的岩石层不被侵蚀，然而外面的柔软岩石就被冲入山谷，于是就形成了一个冠岩。”   * Under the document camera, use a piece of clay to make the formation. Show them where the hard and soft rocks are, and then show what happens as erosion works on the small rock to create a valley.   **T: “Now, I want you to create this formation. Like I did, start with the full uneroded landform, and then show what happens when the soft rock erodes away. You have one minute to do so. Go!”**  “现在，我想要你们来制作这个地形。就像我做的，用全部没有被侵蚀的地形开始，然后看看柔软的石头被侵蚀后会怎么样？你们有1分钟。开始！”  Students make the landform   * Get the students’ attention.   **T: “Remember, a MESA can be formed quickly or slowly. The softer rocks erode on the surface into valleys where they collect water drainage from surrounding areas and the stronger rock layers are left standing. When I say go, I want Partner 1 to turn to Partner 2 and use your model to explain how a mesa is formed. Go!”**  “记住，平顶山可以很快的形成，也可以很慢。表面软一些的石头很快就被侵蚀进入山谷中了，就这样被附近的排水系统吸收了，然而硬一些的石头仍然挺立。当我说开始的时候，我要1号同学用你们的模型向2号同学解释平顶山是怎样形成的。开始！”  Students use their models to explain.  *S1: The softer rock erodes into the valleys while the stronger rocks are left standing and protect the layers below it from eroding.*  “软一点的石头被侵蚀后进入了山谷，然而硬一点的依然还在并且保护下面的岩层不被侵蚀。”  **T: “Great, now when I say go, I want Partner 2 to turn to Partner 1 and use your model to explain how a mesa is formed. Go!”**  “太棒了，现在当我说开始的时候，我要2号的同学用你们的模型向1号同学解释平顶山是如何形成的。开始！”  Students use their models to explain.  *S2: The softer rock erodes into the valleys while the stronger rocks are left standing and protect the layers below it from eroding.*  “软一点的石头被侵蚀进入山谷了，然而硬一点的依然还在并且保护下面的岩层不被侵蚀。”  **T: “Excellent. We know that a mesa can be formed quickly or more slowly as the softer layers of the rock erode into the valleys, and the stronger rock is left standing.”**  “太好了。我们知道平顶山可以很快的形成，也可以更慢一点，当软一点的岩层被侵蚀进入山谷中然而硬一点的石头依然挺立。”   * Post the picture of the butte.   **T: “Mesas get smaller as their cliffs erode and become small, flat-topped hills called buttes. Buttes are formed by** [**erosion**](file:///C:\wiki\Erosion) **when hard** [**rock**](file:///C:\wiki\Rock_(geology)) **covers a layer of softer rock that is easily worn away. The hard rock avoids erosion while the soft rock around it wears down.”**  “随着平顶山的崖壁被慢慢侵蚀，平顶山就变小了，变成了小的、有平顶的小山，它们叫做山丘。山丘的形成是由于坚硬岩石的外表的软一点的岩石被侵蚀。坚硬的岩石不会被侵蚀而外表的柔软岩石慢慢被侵蚀。”   * Under the document camera, use a piece of clay to make the formation. Show them where the hard and soft rocks are, and then show what happens as erosion works on the small rock.   **T: “Now, I want you to create this formation. Again, start with the full uneroded landform, and then show what happens when the soft rock erodes away. You have one minute to do so. Go!”**  “现在，我要你们制作这种地形。再一次，用全部没有被侵蚀的地形开始，然后看看软一点的石头被侵蚀后会怎么样。你们有1分钟。开始！”  Students make the landform.   * Get the students’ attention.   **T: “Remember, BUTTES are formed by erosion when a hard rock covers a layer of softer rock that is easily worn away. The soft rock wears down and the hard rock stays strong. Buttes are the flat-topped hills. When I say go, I want Partner 2 to turn to Partner 1 and use your model to explain how a butte is formed. Go!”**  “记住，山丘是由坚硬岩石的外表的软一点的岩石被侵蚀形成的。软一些的石头被侵蚀了而硬的石头还很坚固。山丘是平顶的小山。当我说开始的时候，我要2号同学用你们的模型向1号同学解释山丘是怎样形成的。开始！”  Students use their models to explain.  *S2: The butte is the flat top on a mesa that gets formed when the soft rock erodes away and the strong rock avoids erosion and covers a layer of softer rock.*  “山丘是在平顶山上的平顶，它的形成是由于软一点的石头被侵蚀，硬一点的石头不会并且覆盖着一层软一点的石头。”  **T: “Great, now when I say go, I want Partner 1 to turn to Partner 2 and use your model to explain how a butte is formed. Go!”**  “很好，现在当我说开始的时候，我要1号同学用你们的模型向2号同学解释山丘是怎样形成的。开始！”  Students use their models to explain.  *S1: The butte is the flat top on a mesa that gets formed when the soft rock erodes away and the strong rock avoids erosion and covers a layer of softer rock.*  “山丘是在平顶山上的平顶，它的形成是由于软一点的石头被侵蚀，硬一点的石头不会并且覆盖着一层软一点的石头。”  **T: “Excellent. We know that a butte is the flat top of a mesa and can be formed when the soft rock erodes away and the hard rock avoids erosion and the hard rock covers the softer rock.”**  “太好了。我们学到了山丘是在平顶山上的平顶，它的形成是由于软一点的石头被侵蚀，硬一点的石头不会并且覆盖着一层软一点的石头。”   * Post the picture of the Grand Canyon.   **T: “This is a Canyon.** **A canyon a deep valley between** [**cliffs**](file:///C:\wiki\Cliff) **often carved from the landscape by a** [**river**](file:///C:\wiki\River)**. This erosion takes a very long time. Canyon walls are often formed of strong** [**sandstones**](file:///C:\wiki\Sandstone) **or** [**granite**](file:///C:\wiki\Granite)**. The** [**Colorado River**](file:///C:\wiki\Colorado_River_(U.S.)) **and the** [**Snake River**](file:///C:\wiki\Snake_River) **run through canyons. The canyon is formed by the water flowing through the river valley eroding the earth beneath it and carrying away loose rock and soil. The rock and soil being carried away weathers the ground beneath it by one object rubbing against another. Over time, a canyon valley can get deeper and deeper.”**  “这是一个峡谷。峡谷是在悬崖之间非常深的山谷，通常是被河流切割而成。这种侵蚀要非常长的时间。峡谷的两壁通常是由非常硬的砂岩或花岗岩形成的。科罗拉多河和斯内克河都穿过峡谷。峡谷是由流水形成的，河谷侵蚀河床并且带走松动的石头和土壤。这些石头和土壤通过物体间的摩擦进一步改变河床。随着时间的过去，峡谷就会变得越来越深。”   * Under the document camera, use a piece of clay to make the formation. Show them a thick mountain that has a canyon cut through by a river.   **T: “Now, I want you to create this formation. You have one minute to do so. Go!”**  “现在，我要你们制作这种地形。你们有1分钟。开始！”  Students make the landform.   * Get the students’ attention.   **T: “Remember, CANYONS are formed by erosion when water flows through the rock forming a valley and eroding the earth beneath it and continuing to weather it away as the rocks and soil rub against each other. It takes a long time to form a canyon. When I say go, I want Partner 1 to turn to Partner 2 and use your model to explain how a canyon is formed. Go!”**  “记住，峡谷是由流水形成的，河谷侵蚀下面的河床并且带走松动的石头和土壤。这些石头和土壤通过物体间的摩擦进一步改变河床。峡谷的形成需要很长时间。当我说开始的时候，我要1号同学用你们的模型向2号同学解释峡谷是怎样形成的。开始！”  Students use their models to explain.  *S1: A canyon is formed when after a long period of time water forms a valley and erodes the land beneath it and carries away rock and soil. The rock and soil continue to weather away the land as they are carried away.*  “峡谷的形成是由流水经过很长一段时间形成山谷之后，侵蚀下面的河床并带走石头和土壤。被带走的过程中，石头和土壤继续侵蚀河床。”  **T: “Great, now when I say go, I want Partner 2 to turn to Partner 1 and use your model to explain how a canyon is formed. Go!”**  “太好了，现在当我说开始的时候，我要2号同学用你们的模型向1号同学解释峡谷是怎样形成的。”  Students use their models to explain.  *S2: A canyon is formed when after a long period of time water forms a valley and erodes the land beneath it and carries away rock and soil. The rock and soil continue to weather away the land as they are carried away.*  “峡谷的形成是由流水经过很长一段时间形成山谷之后，侵蚀下面的河床并带走石头和土壤。被带走的过程中，石头和土壤继续侵蚀河床。”  **T: “Excellent. We know that a canyon can take a long time to form as a river slowly creates a valley by eroding the land beneath it as it carries away rock and soil. The earth continues to be weathered and eroded as the rock and soil rub against each other when carried by the river.”**  “非常好。我们学到了峡谷是经过很长一段时间形成的，是由河水慢慢形成山谷之后，侵蚀下面的河床并带走石头和土壤。被带走的过程中，石头和土壤继续侵蚀河床。”   * Post the picture of the cave.   **T: “This is Painted Cave on Santa Cruz Island in California a cave. Caves are formed by various** [**geologic**](file:///C:\wiki\Geology) **processes. These may involve a combination of chemical processes, erosion from water, tectonic forces, microorganisms, pressure, atmospheric influences, and even** [**digging**](file:///C:\wiki\Cave_digging)**. Most caves are formed in** [**limestone**](file:///C:\wiki\Limestone) **by** [**chemical**](file:///C:\wiki\Solvation) **weathering that dissolves minerals.”**  “这是位于加利福尼亚州的圣克鲁兹岛的一个壁画洞穴。洞穴是在不同的地质作用下形成的。有可能是不同因素的结合，包括化学作用，流水侵蚀，构造力，微生物，压力，大气作用，甚至是挖掘。大多数的洞穴在石灰岩中，在化学作用下，一些矿物质被溶解而形成。”   * Under the document camera, use a piece of clay to make the formation. You could show a couple of different ways; water, slowly dissolving the minerals, digging, etc.   **T: “Now, I want you to create this formation. You have one minute to do so. Go!”**  “现在，我要你们制作这个地形。你们有1分钟。开始！”  Students make the landform.   * Get the students’ attention.   **T: “Remember, CAVES are formed in many different ways, but most caves are formed by chemical weathering that dissolves the limestone and minerals. Caves can get bigger, wider, taller and deeper as the weathering and erosion continues to take place. Even really neat mineral and rock formations can occur within the cave! When I say go, I want Partner 2 to turn to Partner 1 and use your model to explain how a cave is formed. Go!”**  “记住，洞穴可以由多种原因而形成，但是大多数是在化学作用下由石灰岩和其他矿物质的溶解而成。随着风化和侵蚀的继续，洞穴可以变得更大，更宽，更高，或者更深。此外，洞穴中可能会有珍贵的矿物和岩石结构！当我说开始的时候，我要2号同学用你们的模型向1号同学解释洞穴是怎样形成的。开始！”  Students use their models to explain.  *S2: A cave is formed when chemicals dissolve the limestone and minerals which can make the cave bigger and deeper and even create interesting mineral and rock formations within the cave.*  “洞穴是由石灰岩和其他矿物质通过化学溶解而成的，洞穴可以变得更大更深，并且制造出有趣的矿物和岩石结构。”  **T: “Great, now when I say go, I want Partner 1 to turn to Partner 2 and use your model to explain how a cave is formed. Go!”**  “太好了，现在当我说开始的时候，我要1号同学用你们的模型向2号同学解释洞穴的形成。”  Students use their models to explain.  *S1: A cave is formed when chemicals dissolve the limestone and minerals which can make the cave bigger and deeper and even create interesting mineral and rock formations within the cave.*  “洞穴是由石灰岩和其他矿物质通过化学溶解而成的，洞穴可以变得更大更深，并且制造出有趣的矿物和岩石结构。”  **T: “Excellent. We know that a cave is formed in different ways, but many of them are created through chemical weathering in limestone in which the minerals dissolve.”**  “非常好。我们学到了洞穴可以由多种原因而形成，但是大多数是在化学作用下由石灰岩和其他矿物质的溶解而成。”   * Post the picture of the valley.   **T: “This is a valley. There are different types of valleys. A valley formed by** [**flowing water**](file:///C:\wiki\River)**, or river valley, is usually V-shaped. If it is a steep, fast moving river, it will have a narrow valley at the bottom. Shallower slopes may produce wider valleys. A valley carved by** [**glaciers**](file:///C:\wiki\Glacier)**, or glacial valley, is normally U-shaped. The valley shows up when the glacier disappears. The size of the valley depends on the glacier's size.”**  “这是一个山谷。山谷的种类有很多。由流水形成的山谷，或者叫河谷通常是V型的。如果是一个陡峭，湍急的河，在山谷底部会变得很窄。浅一点的水流会塑造出更宽的山谷。由冰川形成的山谷，或者叫冰川谷，通常是U型的。这样的山谷会在冰川融化之后出现。山谷的大小取决于冰川的大小。”   * Under the document camera, use a piece of clay to make the formation. You could make a mountain and a glacier, and show what happens as it moves down. Try to show the U-shaped and the V-Shaped valleys.   **T: “Now, I want you to create this formation. You have one minute to do so. Go!”**  “现在，我要你们制作这种地形。你们有1分钟。开始！”  Students make the landform.   * Get the students’ attention.   **T: “Remember, VALLEYS are formed by a rivers or glaciers. A valley formed by flowing water is V-shaped. If the water is moving fast, there will be a narrow valley at the bottom. Slower moving waters create wider valleys. Valleys created by glaciers are U-shaped and they are created when the glacier warms up and disappears. When I say go, I want Partner 1 to turn to Partner 2 and use your model to explain how the different valleys are formed. Go!”**  “记住，山谷是由河流或冰川形成的。河流形成的山谷是V形的。如果水流很快，山谷底部会很窄。缓慢的水流会制造出更宽的山谷。由冰川形成的山谷，或者叫冰川谷，通常是U型的，这样的山谷会在冰川融化之后出现。当我说开始的时候，我要1号同学用你们的模型向2号同学解释不同的山谷是怎样形成的。开始！”  Students use their models to explain.  *S1: A V-shaped valley is formed by flowing water. It will be more narrow at the bottom if the water is moving quickly. It will be wider at the bottom if the water is moving more slowly. U-shaped valleys are formed by glaciers that melt and disappear.*  “V形山谷是由流水形成的。如果水流的快山谷底部会越窄。如果水流的满山谷底部会越宽。U型山谷是由冰川融化之后形成的。”  **T: “Great, now when I say go, I want Partner 2 to turn to Partner 1 and use your model to explain how the different valleys are formed. Go!”**  “好，现在当我说开始的时候，我要2号同学用你们的模型向1号同学解释不同山谷的形成。”  Students use their models to explain.  *S2: A V-shaped valley is formed by flowing water. It will be more narrow at the bottom if the water is moving quickly. It will be wider at the bottom if the water is moving more slowly. U-shaped valleys are formed by glaciers that melt and disappear.*  “V形山谷是由流水形成的。如果水流的快山谷底部会越窄。如果水流的满山谷底部会越宽。U型山谷是由冰川融化之后形成的。”  **T: “Excellent. We know that there are different kinds of valleys. V-shaped valleys are formed by flowing water. If the river is flowing quickly, there with be a narrow valley. If the water is moving slowly, there will be a wider valley. U-shaped valleys are created by glaciers that have melted and no longer exist.”**  “好极了。我们学到了不同种类的山谷。V形山谷是由流水形成的。如果水流的快山谷底部会越窄。如果水流的满山谷底部会越宽。U型山谷是由冰川融化不见之后形成的。”  **Guided Practice: (10 minutes)**  **T: “Now, I want you to pick one of your favorite landforms on the board and make it. When you are finished, put it in the middle of your desk, put your hands in your lap, and look up at me. That is how I will know that you are ready to move on. You have 1 minute. Go.”**  “现在，我要你们选一种在白板上的你们最喜欢的地形，然后制作它的模型。做完以后，把模型放在桌子中间，把手放在腿上，然后看我。这样我就知道你准备好继续下去了。你们有1分钟。开始。”   * Post your sentence frames on the board.   What landform did you create?  I created a \_\_\_\_\_\_.  How is a \_\_\_\_\_\_\_\_\_ formed?  A \_\_\_\_\_\_\_\_\_ is formed by weathering and erosion because \_\_\_\_\_\_.  你制作了什么地形？  我制作了\_\_\_\_\_\_。  \_\_\_\_\_\_\_是如何形成的呢？  \_\_\_\_\_\_\_是通过风化和侵蚀形成的因为\_\_\_\_\_\_。  **T: “We are going to teach each other how weathering and erosion create these different landforms. Now that you have all made one, we will work with our tables to discuss how they were made in real life. I need you to number off on your tables. Decide who will be 1, 2, 3, and so on. You have 10 seconds to decide. Ready. Go.”**  “我们将要互相告诉同伴不同地形是如何由风化和侵蚀形成的。现在你们都做好了模型，我们现在要和同桌的同学来讨论在现实生活中它们是怎样形成的。我要你们同桌的报数，来决定谁是1，谁是2，谁是3，等等。给你们10秒钟，准备，开始。”   * Students turn to their neighbors and decide who is 1, 2, 3, etc. Wait ten seconds and regain their attention.   *Use the Modeling Cycle:*  *Teacher Does:*  **T:** Refer to the sentence frames as you model the process. **“When I say ‘Go!’ the whole table will turn to person 1 and together ask, ‘Which landform did you create?’ Person 1 will answer ‘I created a \_\_\_\_\_\_\_.’ And tell the group what their formation is. Then, the whole table will turn to person 1 and together ask, ‘How is a \_\_\_\_\_\_\_ formed?’ Person 1 will teach the group using the last sentence frame. He/she will say, ‘A \_\_\_\_\_\_\_\_ is formed by weathering and erosion because\_\_\_\_.’ And then finish the sentence in his/her own words. As you explain, you do the actual weathering and eroding on the clay. Next, the table will ask Person 2 and Person 2 will teach about his/her landform.**  **I am Person 1 and these are my imaginary table friends.”** (You could refer to a specific table or use multiple puppets, stuffed animals or other objects to represent your table.)  “当我说开始的时候，同桌的所有人一起问1号同学，‘你做了什么地形？’1号同学就会说‘我做了\_\_\_\_\_。’然后告诉其他人它的构造。然后，同桌的所有人一起问1号同学，‘这地形是怎么形成的？’1号同学就会用最后一个句型还告诉其他人。他/她会说，‘\_\_\_\_\_\_是由风化和侵蚀造成的因为\_\_\_\_\_\_。’用他/她自己的话来完成句子。在你解释的同时，在粘土上演示风化和侵蚀的过程。下一步，同桌的所有人将会问2号同学，2号同学就会展示他/她的地形。我是1号，这些是我的想象的同桌们。”   * Refer to the sentence frames throughout the modeling cycle.   **T(2): “Which landform did you create?’’**  “你做了什么地形？”  **T(1): “I created a butte.**  “我做了一个山丘。”  **T(2): “How is a butte formed?”**  “山丘是如何形成的？”  **T(1): “A butte is formed by weathering and erosion because when the soft rock erodes away and the strong rock avoids erosion and covers a layer of softer rock..”** As you explain the process, show the students how to explain it using the clay model.  “山丘是由风化和侵蚀造成的，因为软一些的石头被侵蚀走了，硬的石头没有被侵蚀并且覆盖了一层软一些的石头。”  *Teacher Does with Students:*   * Refer to the sentence frames throughout the modeling cycle. Call on a student to help model the process for you. Have their table help with the first question.   **T *and students on the table*: “Which landform did you create?’’**  “你做了什么地形？”  *S: I created a canyon.*  “我做了一个峡谷。”  **T *and students on the table:* “How is a canyon formed?”**  “峡谷是怎样形成的？”  *S: A canyon is formed by weathering and erosion because after a long period of time water forms a valley and erodes the land beneath it and carries away rock and soil. The rock and soil continue to weather away the land as they are carried away..”*  “峡谷是由风化和侵蚀形成的，因为经过很长的时间流水形成了河谷，河谷侵蚀下面的河床并且带走松动的石头和土壤。这些石头和土壤通过物体间的摩擦进一步改变河床。”   * Help them explain it using the clay model.   *Group of Students Do:*   * Find out who is person 2 on that same table and have them model the process for the class asking student 2.   *S: What landform did you create?*  *S2: I created a mesa.*  *S: How is a mesa formed?*  *S2: A mesa is created by**weathering and erosion because* s*ofter rocks are eroded away on the surface into valleys, where they collect water drainage from the surrounding area, while the stronger rock layers are left standing out.*  “你做了什么地形？”  “我做了一个平顶山。”  “平顶山是怎样形成的？”  “平顶山是由风化和侵蚀形成的。因为表面软一些的石头被侵蚀进入了山谷，就这样被附近的排水系统吸收了，然而硬一些的石头仍然挺立。”  *All Students Practice:*  **T: “That was really well done! I think you are all ready to do this. Make sure that you are listening to the person on your table who is explaining how their landform is made. I will give you 5 minutes. Ready? Go!”**  “做的太好了！我觉得大家都准备好了。确保别人在讲他们如何制作他们的地形的时候要认真听。给你们5分钟。准备好了吗？开始！”   * Walk around the room observing and helping where needed. Ensure students are staying in the target language. * Get the students’ attention and have a few students (who you noticed did well) with different landforms share. Have them show their clay model on the document camera as they share so that the class can see multiple examples.   **Independent Practice: (5 minutes)**   * Place the exit ticket under the document camera for the class to see.   **T: “To see if we met our objective, we’re going to complete this exit ticket. It says, ‘What landform did you create?’ to which you will use the complete sentence to respond, ‘I created a \_\_\_\_\_\_\_.’ The second question asks, ‘How is that landform formed?’ to which you will use a complete sentence to respond, ‘A \_\_\_\_\_\_\_\_\_\_ is created of weathering and/or erosion because…’ You will work on this independently. Your papers will be passed out and when I say, ‘Go’ you will write your names and begin. Turn your paper over when you are finished.”**  “要知道我们达到我们的目标没有，我们将要完成这个退出卡。上面写着‘你（们）制作了什么地形?’，大家要用完整的句子来回答‘我制作了\_\_\_\_\_\_。’第二个问题是，‘这种地形是怎样形成的?’，大家要用完整的句子来回答，‘\_\_\_\_\_\_是由风化是侵蚀形成的因为\_\_\_\_\_\_\_\_\_’你们将要独立完成。这个卡我会发给你们，我说开始的时候，你们要写上你们的名字然后完成问题。写好了以后把卡反过来。”   * Pass out the exit tickets to the students.   **T: “Go!”** “开始”   * Give students 5 minutes to write their sentences. Walk around the class and ensure students understand the directions and what they are to do. After five minutes, have the students turn in their papers with their finished clay model. When they dry or harden, you can have them paint or color their models and put them on display.   **Closing: (5 minutes)**  **T: “On the board you will see our learning objective for today. Let’s see if we met our objective.”**  “在白板上有我们今天的学习目标。让我们看看我们是否都完成了。”   * Point and refer to the objective on the board: I can show the affect of weathering and erosion on different landforms (such as a mesa, butte, canyon, cave and valley) over time by creating a model and explaining how I formed it on an exit ticket independently.   我可以说出风化和侵蚀随着时间的变化对不同地形的影响（比如平顶山，山丘，峡谷，洞穴和山谷），通过制作一个模型，并且独立的在退出卡上解释我是怎样做出来的。  **T: “When I say ‘go’ you will turn to your partner and you will both read the objective on the board together. Go.” Give the class 20 seconds.”**  “我说开始的时候，你和你的同伴要一起读出白板上的学习目标。开始。”给大家20秒。  Students read the objective.  **T: “When I say ‘go’ Partner 2 will turn to Partner 1 and explain what we learned today in your own words.”**  “我说开始的时候，2号同学用自己的话向1号同学解释一下我们今天学了什么。”  *S1: We learned how weathering and erosion changed different landforms such as a mesa, butte, canyon, cave and valley.*  “我们学了风化和侵蚀是如何改变并形成不同地形的，比如平顶山，山丘，峡谷，洞穴和山谷。”   * Get the students’ attention.   **T: “When I say ‘go’ Partner 1 will turn to Partner 2 and explain how we know we met our goals.”**  “我说开始的时候，1号同学向2号同学讲一下我们如何达到学习目标的。”  *S2: We wrote on an exit ticket and explained how weathering and erosion made a certain landform.*  “我们在退出卡上写出了风化和侵蚀是如何制造某一种地形的。”  Call on a high, medium and low student in that order to share what they learned.  **T:** When applicable, ask students the question, **“How do you know that you learned that?”**  “你怎么知道你学会了？”  **T: “Okay, just as a final assessment, let’s see how good we feel about what we learned today. When I say ‘Go’ I want you all to give me either a thumbs up, thumbs down or thumbs in the middle to show me how well you think you met the objective today and learned about evaporation. If you know a lot about landforms and feel you could teach how they are made to someone else, give me a thumbs up. If you know some things about landforms and feel you could tell me some things give me a thumbs in the middle. If you didn’t learn a lot about landforms and feel you need more help and practice, give me a thumbs down. Ready, Go!”**  “好，最后检验一下，让我们看看今天学的怎么样。我说开始的时候，我要你们大拇指向上，大拇指向下，或者大拇指在中间来说明你们今天达到目标和学习风化和侵蚀的好坏。如果你懂的很多关于地形的知识，并且你觉得你可以给别人讲地形是怎样形成的，请大拇指向上。如果你知道一些关于地形的只是，并且你觉得你可以告诉我一些，请大拇指向中间。如果你没有学到什么关于地形的知识，并且觉得需要帮助和更多联系，请大拇指向下。准备好了吗？开始！”   * Assess the class and their self-assessment and analysis of the understanding of the content.   **T: “Great. We’ll continue to practice and learn more about landforms during this unit and throughout the year. I want you to look around and notice all of the different geological shapes around you. We really do live in an amazing place.”**  “好。我们这单元和整年都会继续联系和学习关于地形的知识的。我想让大家互相看看周围的不同地形。我们真的生活在一个神奇的地方。” | | | | |
| **Assessment:** | | | | |
| Observe students in the guided practice and watch for language production and errors in reasoning.  Observe clay models.  Correct the Exit Tickets | | | | |
| **Extra Ideas:** | | | | |
| * *You may need to give more direct/specific instruction about the different landforms and how they are made.* * *Paint and decorate the models* * *Have them write a story about the landform and how it changed over time.*   *Landform Games:*   * Help students learn or review landforms by using the landform cards to match the name and picture, place Concentration, or play Pictionary.   How would the Earth look if we didn’t have any weathering, erosion,  *Creating Landforms:*   * Relate the building up and breaking down of the Earth's surface to the landforms they identified. Record answers in their “Earth’s Surfaces” book. * What probably causes a mesa to form? (uplift) * What probably causes a butte to form? (weathering and erosion of a mesa) * Why is the slope more gentle at the base of mesas? (deposition; erosion and weathering break the rocks down and the material is deposited at the base.) * What landform does a volcano create? (mountain) * How long does it take for all this to happen? (A long, long time. The deposits that forms the rocks of the Grand Canyon are 300 million years old. The uplift that started the erosion that formed Bryce Canyon started 13 million years ago.) | | | | |

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| --- |
| Butte |
| Mesa |
| Canyon |
| Cave |
| Valley |

Exit Ticket

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What landform did you create?

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How was this landform formed?

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Exit Ticket

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What landform did you create?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

How was this landform formed?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Exit Ticket

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What landform did you create?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

How was this landform formed?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

退出卡

姓名:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 班级：\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 日期:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

你（们）制作了什么地形?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

这种地形是怎样形成的?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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退出卡

姓名:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 班级：\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 日期:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

你（们）制作了什么地形?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

这种地形是怎样形成的?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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退出卡

姓名:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 班级：\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 日期:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

你（们）制作了什么地形?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

这种地形是怎样形成的?

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_