MARS JOURNEY: Building the story together

workshop on storytelling
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Overview

This is a short, step-by-step guide for using collaborative story-building in the classroom, as a way to support your students in developing their stories about the Journey to Mars, by:
• introducing them to the most basic elements of a story
• scaffolding their storytelling with tangible constructions of tabletop story-worlds

The activity is structured as follows:
1. Setting: building a story-world from a written description
2. Characters: creating characters to populate the story world
3. Goals and Obstacles: giving characters something difficult to strive for
4. Story Opening: finding a good place and an interesting way to begin the story
5. Story Development: advancing the story by getting characters to act within the story-world in pursuit of their goals

As you work through these steps, I invite you to think about how science and technology knowledge related to Mars exploration may be embedded into the activity. I also invite you to think how the activity fits in your own work, how you would you use it your classroom and what you might modify and adapt.
Preparation

Classroom Setup
Students will work in groups of 3-5. Each group will work around a dedicated table.

Ideally, students will have access to the STORIES platform during the activity, so that they can move between their tangible tabletop story-world and the authoring tools of the platform, especially in steps 4 and 5. However, if this is not possible, the activity can be done off-line, making the completion of the story in the platform a separate task.

Students will probably use their tabletop story-worlds many times during the STORIES activity, so it is advisable to think beforehand about storage between sessions.

Materials
Each group of students will need:
• a large sturdy drawing paper (~70x100cm)
• a box of ColorMarkers
• printed slips of setting descriptions (see Box 1 below)
• ~5 index cards (8x13 cm)
• ~5 small metal clips (for propping up the cards)
• notebook or writing paper
• pens and pencils.
Story-building step 1: Setting

The first step is to build a tabletop story-world: a concrete useable representation of the setting for an episode of the Journey to Mars. For example, there may be the following settings and episodes:
1. Headquarters → Planning Trip to Mars
2. Spaceship → Travelling to Mars
3. Landing Site → Surviving on Mars
4. First Human Base → Exploring Mars
5. Mars Colony → Living on Mars

NOTE: These settings correspond roughly to the STORIES phases of action, but they are merely indicative. I use them here to illustrate the activity, but feel free to adapt them or to come up with other settings together with your students based on their inquiry.

To begin building the story-world, have each group of students gather around their dedicated table and provide them with a large drawing paper and a set of color markers.

Give each group a short written description of a setting. In box 1, there are examples of descriptions for the above five settings.¹

Invite the students to draw the setting. Guide them to read carefully as a group the written description, define and draw the main areas of the setting and then continue adding details.

Ask them to move beyond the description and use their knowledge of Mars exploration to imagine what else might be there: objects, landscape elements, equipment etc.

Encourage students to keep asking themselves “what else is there?” and adding expected and unexpected details. A richer setting will make for a better story.

¹. These descriptions are based for their scientific content on the STORIES Implementation Guide, as well as on the series of booklets that form the STORIES Tool-kit.
AGE: 23
GENDER: Female
FAMILY: Mother, brother
PROFESSION: Engineer
SKILLS: Cooking, rock climbing
LIKES: Dogs, ice cream
DISLIKES: Crowds
FEARS: Darkness
**Things to consider**

- Expect drawing the story-worlds to be the most intensive part of this activity. Drawings can be more or less elaborate, depending on how much time you choose to dedicate.
- The story-world is a map, not a painting. Artistic quality and realism are less important than being able to map out the world students imagine for their story. Allow students to label things they cannot draw well, so they are recognizable.
- Consider your options for organizing the activity in the classroom: Will you build the settings for all episodes simultaneously, having different groups work on different settings and then share? Or will each group build each setting consecutively at each STORIES phase? Do you want all their settings to be equally detailed, or do you want them to focus on one or two settings, to correspond with where the put their emphasis in the story?
- Drawing is the most rudimentary way to build a story-world and can be accommodated in almost any classroom situation. However, if your resources and time permit, consider more involved constructions like dioramas. It is also possible to combine drawing with robotics objects, models or other 3D constructions that you have created as part of your STORIES inquiry.
- For the written description of the setting, consider the right amount of detail for your students. Of course language needs to be adjusted to their reading level. Further, look for the right balance between giving them enough information and leaving enough room for them to use their own knowledge and imagination. Consider what scientific knowledge is important for students to attend to, and make sure you embed it in the description.
- As your students engage in drawing their story-world, opportunities for deeper learning will arise. For example, they may include something in their setting that is scientifically impossible. Maybe, some experiment that they have already performed will be relevant to what they are attempting to draw. New questions may also arise that can drive them to seek more knowledge about the Mars environment, about space technology etc.
BOX 1: Building a Story-World: Five Setting Descriptions

1. Mission Headquarters → Planning the Journey
The headquarters for the planning of the Journey to Mars. In the Central Planning Area, workstations for the various aspects of planning (e.g. launch calculations, Mars landing options, meteorological monitors etc.). Next to it, the Selection and Training Center, for evaluating applicants for the mission and training them for the conditions that they will encounter. Nearby, Experimentation and Design Labs for developing and testing equipment, material and techniques. Visible in the distance, is the Launching Site.

2. Spaceship → Travelling to Mars
The long and narrow cylindrical capsule of the spaceship. Spaceship controls and monitors for navigation, temperature, pressure, radiation, etc. The necessities for the six month trip to Mars: a compartment with packaged foods and an oven for their preparation; medicine and hygiene supplies; the toilet; sleeping cots; exercise equipment. Water, air and waste management systems. Airlocks and shields.

3. Mars Landing Site → Surviving on Mars
A barren landscape like a desert. Everything covered in sand. Sharp rocks and flat sandstones. Winds blow raising dust that sticks on everything and makes it hard to see. The air is unbreathable: the atmosphere is very thin and consists mostly of CO₂. Levels of radiation are high. Gravity about 1/3 of that on earth. Under the soil, there is a known deposit of ice water. CHOOSE YOUR LOCATION and add location-specific details to the landscape
A. The vast planes of the north: extensive fields of sand dunes large and small; few impact craters; dust storms
B. The southern mountain areas: rugged terrain, steep mountains; many impact craters; rocky areas of remnant magnetization
C. The equatorial Tharsis Bulge: huge ancient volcanos; canyons; lava tubes
Somewhere in this landscape now stands the landing vehicle. Around it there are large parcels. These may include: supplies (air, water, food, seeds, plants...); pre-fabricated building components; machines and vehicles; scientific instruments.
4. First Human Base on Mars → Exploring Mars
A barren landscape like a desert. Everything covered in sand. Sharp rocks and flat sandstones. Winds blow raising dust that sticks on everything and makes it hard to see. The air is unbreathable: the atmosphere is very thin and consists mostly of CO₂. Levels of radiation are high. Gravity about 1/3 of that on earth.
CHOOSE YOUR LOCATION and add location-specific details to the landscape
D. The vast planes of the north: extensive fields of sand dunes large and small; few impact craters; dust storms
E. The southern mountain areas: rugged terrain, steep mountains; many impact craters; rocky areas of remnant magnetization
F. The equatorial Tharsis Bulge: huge ancient volcanos; canyons; lava tubes
Somewhere in this landscape now stands the first human base on Mars, located strategically and built appropriately to offer insulation as well as protection from radiation and from meteoric strikes.
The main shelter, serves as living and working quarters. The interior consists of compartments with buffer doors to reduce the risk of accidental air loss. Basic amenities for work, rest, cooking and hygiene. External doors have airlocks and decompression chambers. Controls for monitoring and regulating pressure, air quality and temperature are everywhere.
Other facilities: greenhouse; water processing facility; oxygen producing facility; power plant; storage facilities; and a landing site.

5. Mars Colony → Living on Mars
Select the location of the colony and detail the location-specific landscape.
A. The vast planes of the north: extensive fields of sand dunes large and small; few impact craters; dust storms
B. The southern mountain areas: rugged terrain, steep mountains; many impact craters; rocky areas of remnant magnetization
C. The equatorial Tharsis Bulge: huge ancient volcanos; canyons; lava tubes
A colonial town, located strategically and built appropriately to offer insulation as well as protection from radiation and from meteoric strikes. Public services, workspaces and houses, athletic and recreation facilities. Building interiors consist of compartments with buffer doors to reduce the risk of accidental air loss. Controls for monitoring and regulating pressure, air quality and temperature are everywhere. External doors have airlocks and decompression chambers. Surrounding the town are greenhouses; water processing plants; oxygen producing facilities; a power plant and a landing port.
The landscape remains desert-like. Levels of radiation are high. Gravity about 1/3 of that on earth. Atmosphere remains thin and heavy in CO₂, though efforts to terraform Mars are beginning to thicken the atmosphere increasing the oxygen content, temperature and pressure.
Story-building step 2: Characters

Having built the story-world, it is now time to populate it, by creating the main characters who will be the protagonists of the story, throughout all the episodes.

To create their characters, students will use index cards, color markers, pens and pencils. They will represent each character on one index card.

The front side of the card serves to identify the character at a glance. Students will draw a picture of their character and also choose a name for the character and write it by the picture.

The back side of the card serves to elaborate the identity and personality of the character, as a list of attributes (see box 2). You may guide students to start with a few key attributes (age, gender, profession etc.) and keep expanding their list, by asking themselves questions (what does my character like to do for fun? what is my character’s greatest fear?) to spark their imagination. They may add as many attributes as they like. Richer characters make for better stories.

To complete character creation, invite students to add two more details: important items of clothing their character should have and a very personal object the character would always have with them, wherever they go. They may draw these items in the front of the card, or add them to the list on the back, as they see fit.

Finish this step ceremoniously, by asking students to prop up each index card vertically on a small clip and then to position each standing character at a meaningful place within the story-world.
Things to consider

• Students will need to create at least two main characters, but they may choose to create more if time permits. They may also create more characters in subsequent episodes. However, be careful with character proliferation: too many characters and it will be difficult to keep track of the story. As a rule of thumb, students should create no more than five characters. Keep in mind that these are the main characters, the protagonists of the story. Other people may appear in the written story, to support the main characters. But students will be writing the story of the protagonists.

• Expect most characters that your students will develop to be people. However, do not be surprised if some students propose non-human characters such as pets or robots. Consider how to set limits to flights of fancy that can defeat the learning purpose of the activity, without discouraging your students’ imagination. This is your judgment call: would you accept a talking dog as a protagonist in the story?

• As your students engage in creating their characters, opportunities arise for raising questions about the abilities, expertise and personal qualities that will be important from survival and success during the Mars Journey.

BOX 2: The Character Card

<table>
<thead>
<tr>
<th>FRONT SIDE: Identity</th>
<th>BACK SIDE: Characterization</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Name</td>
<td>• Age</td>
</tr>
<tr>
<td>• Drawing</td>
<td>• Gender</td>
</tr>
</tbody>
</table>

ADD:
• important items of clothing  
• a very personal object

• Other Skills and Abilities  
• Interests and Motivations   
• A Major Strength            
• A Major Flaw                
• Likes                       
• Dislikes                    
• Fears                       
• (more...)
GOALS

* explore mineral composition of Mars
* what food type can be grown on Mars

Obstacles
1. Getting H2O from glacier.
2. Used too much energy during life
3. Overcame boredom.

Water supply
Story-building step 3: Goals and Obstacles

With the protagonists placed in the setting, the next step is to articulate the goals that will spur them into action.

Let your students discuss in their group the goals of their protagonists, taking into account the setting and the character attributes: what are these characters doing here? why did they come? what do they want? what are they trying to achieve?

Allow for enough discussion and then ask the students to select the most important goal for their characters and to write it down as a goal statement. This is the main goal that will drive the story in this episode.

Next, ask students to identify and write down at least three obstacles to the main goal: problems the protagonists will need to solve or difficulties they will need to overcome. Placing obstacles in the course of the protagonists, makes for a more interesting story, because the attainment of the goal is no longer a straight line: it involves setbacks, failure, problem-solving, trial and error, struggle and risk.

Things to consider

- Working with one main goal and three obstacles is a good starting strategy, because it creates a clear direction for the story. The setting and characters already present a rich complexity, so it is advisable to keep a single, straightforward goal. However, if you think your students are ready for even more complexity, you may consider having them work with more goals. For example, there may be short-term goals (such as keeping alive in a hostile environment) and long-term goals (such as sustainable agriculture on Mars). Or there may be individual goals for each character that either complement or contradict the main goal that they have in common.
- Goals and, especially, obstacles present great opportunities to embed science and technology learning in this activity. Use this step as an opportunity to review with your students what they have learned in their inquiry so far, in order to select the best goals and obstacles to drive their story.
Story-building step 4: Writing a Story Opening

So far, students have not yet begun writing the story. What they have done, by creating the setting, characters, goals and obstacles, is to lay the groundwork. Now it is the finally time to put pen on paper. There are many ways to start writing a story, but in a collaborative writing, it is easier to begin at the beginning.

First, convey to your students how important the opening of the story is: it is what catches the readers’ attention and makes them want to read the story. Explain that to make the opening of their story engaging they have to find both an alluring starting point and an appealing form (be it narration, description, dialog, verse, message etc.). If time permits, you may have students look at existing stories and see how their authors crafted a good beginning. Or you may have them recall how some of their favorite stories begin.

In crafting the opening of the story we will combine individual and collaborative writing.

First ask students to write individually the best opening sentence they can think for the story.

Then, ask them to share their opening sentences in the group, and use them as inspiration to compose together the story opening (e.g. an opening paragraph, a short dialog, etc.)

Things to consider

- Depending on the particular circumstances of your classroom, consider if this would be good point for introducing the STORIES platform to the activity. Students could use the platform to compose together their story opening and go on from there to use the platform tools for developing their story.
**Story-building step 5: Story Development**

Students can now begin to develop their story, by alternating between actual writing and exploring the plot possibilities present in their tangible story-world, i.e. possible moves for their characters in accordance with their goal and their personal traits, using everything in the setting: environment, landscape, material, buildings, equipment, objects etc.

First, assign a group scribe, who will be responsible for writing down the story. The role should rotate every 15’-20’ minutes. The scribe first writes down the story opening from the previous step and then keeps recording the story as it develops.

Invite students to look carefully at their tabletop story-world and to take turns proposing: (a) characters actions that can drive towards the goal; (b) events that occur as a consequence of character actions; (c) occasional random events (e.g. weather events).

The scribe writes down what is being proposed. Every time the scribe changes, they group may read and review the story.

**Things to consider**

- Consider how to balance between allowing students enough leeway to develop an interesting story and ensuring that they bring it to a closure. Overall, reminding them to have their goal and obstacles in mind, will help keep the story for diverging more than it is manageable. It is also useful to impose time constraints, i.e. allot a specific time period for story development, followed by a period for editing and completing the story.
- Ideally, students would have access to the STORIES platform during story development, so that they can move between their tangible tabletop story-world and the authoring tools of the platform. However, if this is not possible, story development can be done offline and the story entered into the platform for editing and completion.
- Story development presents opportunities for deeper learning similar to the drawing of the story-world: fact-checking the scientific accuracy of proposed story-moves; working into the plot knowledge gained from experiments and other inquiry activities; teachable moments arising from the need to know something (e.g. about the Mars environment, about human biology, about technology etc.), because it is important for the story.
“There’s always room for a story that can transport people to another place”

J.K. Rowling
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