

# STEM Career Bingo

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**S**TEM Career Bingo is an activity that raises student awareness of career opportunities in STEM fields. During the activity, students are presented with STEM job descriptions, learn how much education is required for each job, and discover which jobs might be right for them (Kier and Blanchard 2017). This activity can incorporate laptops and smart phones for a high-tech approach but can also be carried out with pencil and paper. (See Resources for the game boards, informa-

tional sheets, and other materials described in this article.)

## Preassessment

Before you begin, ask students if they can explain what STEM stands for (science, technology, engineering, and mathematics) and then have students brainstorm a list of STEM careers. These might include an airplane designer, a nurse, a computer programmer, and a video game designer. Save this list of careers so it can be compared to a new list generated at the end of the activity.

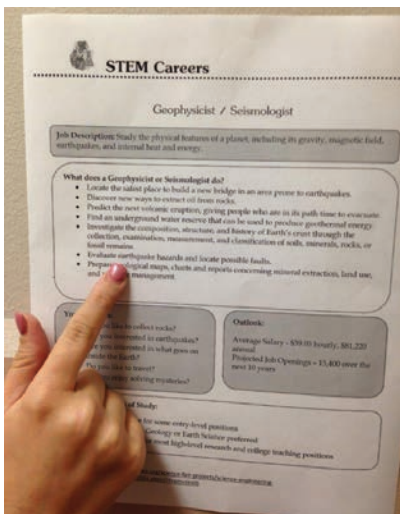
card for each student in your class.

Next, print out the 30 career fact sheets (Figure 1) and tape them to walls, lab tables, or desktops throughout your room to create career stations. All 30 career fact sheets do not need to be used. Just make sure that you have enough stations to avoid bottlenecks—no more than two students should be at a station at any given time. A stack of STEM Bingo Worksheets (Figure 2) should also be available at each station or at a central location where they can be collected by students. Students will visit each station to gather facts that correspond to the squares on their bingo cards and to complete a worksheet.

Before you start the game, distribute a bingo card to each student along with a writing utensil. Clipboards may also be useful. If you are using plain paper bingo cards, then students can use pencils. If you are using laminated cards, students should use dry- or wet-erase markers. Have students move to an open station, and at your signal, they can start gathering career information.

When a student visits a station, he or she reads the career fact sheet

**FIGURE 1:** Fact sheet



## The low-tech approach

We have provided four versions of our STEM Career Bingo cards for you to download and print out (see wiki; Online Supplemental Materials). If possible, laminate two different versions back-to-back so each student can have a choice of cards and to allow the cards to be reused with other classes. If you prefer, you can create your own card using one of the many bingo card generators available online (see Resources). You will need one

and then places an X on a space on his or her Bingo card with a corresponding career fact that best fits that career. For example, a student exploring the biochemist career fact sheet could put an X on the Bingo square that says “uses chemicals.” The student must also write “biochemist” in the square to indicate which career fact sheet provided the information. Some facts, such as salary, may fit more than one career. In this case, students can choose which square they want to mark off—this can be useful when trying to complete a row to achieve Bingo! Before moving to a different station, the student must then complete that row of the STEM Bingo Worksheet (Figure 2) to gather more information about the career.

After the worksheet is completed, the student moves to another station and completes the steps described above. The game ends when a student has completed a horizontal, vertical, or diagonal row on his or her card, and yells “Bingo!” At this point, the teacher or students can check to see if the card has been completed correctly. If the facts match up with the careers listed on the card, then a winner is declared and a new round can begin. If the card is incorrect, restart the game until another Bingo is declared.

### The high-tech version

In the high-tech version of this game, students become mobile career stations that their classmates must visit to gather the

#### CONTENT AREA

STEM

#### GRADE LEVEL

5–9

#### BIG IDEA/UNIT

STEM career information

#### ESSENTIAL PRE-EXISTING KNOWLEDGE

None

#### TIME REQUIRED

15–75 minutes

#### COST

None

**FIGURE 2: STEM Bingo Worksheet**

| STEM Bingo Worksheet  |   | Name _____   | Date _____  |
|---|---|--------------|---|
| What’s your STEM career match?  |   |              |   |
| Career  | Match on Bingo card   | Interested?  | Fun facts   |
| <i>Food scientist</i>   | <i>Requires a bachelor’s degree and good communication skills</i> | <i>Maybe</i> | <i>Food scientists make chemistry fun by developing ways to make ice cream less fattening and still taste good!</i> |
| What traits do you have that might make you successful in this career?  |   |              |   |
| Career  | Match on Bingo card   | Interested?  | Fun facts   |
|   |   |              |   |
| What traits do you have that might make you successful in this career?  |   |              |   |
| Career  | Match on Bingo card   | Interested?  | Fun facts   |
|   |   |              |   |
| What traits do you have that might make you successful in this career?  |   |              |   |
| Research a career that you learned about today. Write one or two paragraphs about the career, why you chose it, and what you would need to do to get hired for that career. |   |              |   |

necessary career information. Instead of reading the career information from handouts, students will download short video presentations of the information by scanning Quick Response (QR) codes. The codes are printed on 20 × 20 cm cards that are hung from lanyards worn by students (Figure 3). Scanning the codes using an app on a tablet or smart phone will open a link to a job description video presentation, some of which were created by the authors (see Resources). Feel free to use these presentations with your class or create your own if you are familiar with the necessary technology. Many free QR reader apps are available (see Resources). Students will need to download one to their device before the start of the game.

As in the low-tech version, students circulate throughout the room collecting the career information and completing their Bingo cards and worksheets. Students should wear their lanyards so that the QR codes are displayed on their backs and be reminded to hold still when another student is trying to scan the code. Students should wear earbuds, if possible, when listening to the videos. If earbuds are not available, they can listen with the volume turned down low.

If time permits, have students start researching and writing a paragraph describing a STEM career they might want to pursue. These can be finished as homework.

### Postassessment

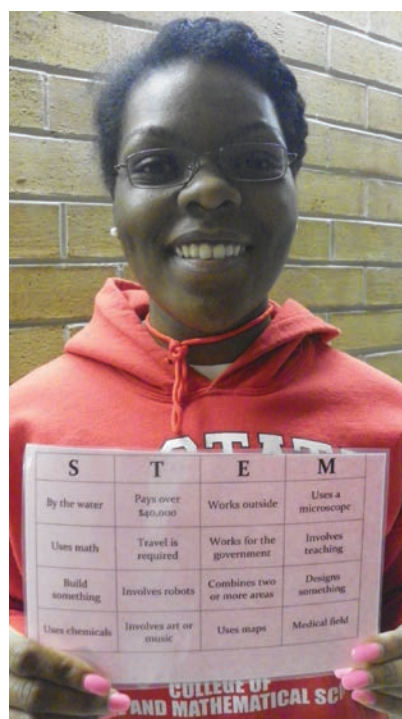
The day after the bingo activity,

ask students to brainstorm another list of STEM careers. Typically, students will be able to expand on the list they generated prior to the activity and provide more accurate job titles, such as aeronautical engineer in place of airplane builder. After they have completed their list, ask for volunteers to read their paragraphs about STEM careers they might want to pursue.

### STEM career awareness in the Next Generation Science Standards

By connecting STEM activities to career exploration, teachers are also addressing the *Next Generation Science Standards*, which emphasize college and career readiness. STEM career exploration engages students in crosscutting disciplines, allowing them to see how classroom activities and future careers relate to subjects, college majors, and career disciplines such as physics and algebra (NGSS Lead States 2013). Moreover, career explorations are recommended for upper elementary school and middle school students, to provide them with information that may be relevant to their lives and increase their interest and the development of goals (Orthner et al. 2013; Wang and Degol 2013). STEM Bingo provides a way to insert career exploration into virtually any topic in an engaging way and can be played many times throughout the year. ●

**FIGURE 3:** A lanyard allows students to display the QR codes



## REFERENCES

Kier, M. W., and M.R. Blanchard. 2017. Exploring the experiences of four underrepresented, rural US middle school students during a STEM career intervention. Manuscript submitted for publication.

NGSS Lead States. 2013. *Next Generation Science Standards: For states, by states*. Washington, DC: National Academies Press. [www.nextgenscience.org/next-generation-science-standards](http://www.nextgenscience.org/next-generation-science-standards).

Orthner, D.K., H. Jones-Sanpei, P. Akos,

and R.A. Rose. 2013. Improving middle school student engagement through career-relevant instruction in the core curriculum. *The Journal of Educational Research* 106 [1]: 27–38.

Wang, M.T., and J. Degol. 2013. Motivational pathways to STEM career choices: Using expectancy-value perspective to understand individual and gender differences in STEM fields. *Developmental Review* 33 [4]: 304–340.

## RESOURCES

Game boards, informational sheets,

and other materials—<http://stemcareerawareness.wikispaces.com/HOME+PAGE>

Free QR reader apps— i-nigma, Kaspersky's QR Scanner, Quick Scan [<http://uqr.me/blog/best-qr-code-readers/#QuickScan>]

STEM career videos—<http://stemcareerawareness.wikispaces.com/VIDEO+LIST>

## ONLINE SUPPLEMENTAL MATERIALS

STEM Bingo Worksheet and sample Bingo cards, fact sheets, and scripts—[www.nsta.org/scope1709](http://www.nsta.org/scope1709)

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