

# Magic Carpet

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This activity is based on IOLA materials on introductory linear algebra, available here:

<http://iola.math.vt.edu> and discussed here:

<https://www.tandfonline.com/doi/abs/10.1080/10511970.2012.667516>.

## 1 Goals

The goals of this activity are:

1. To introduce students to vectors and vector notation.
2. To introduce students to the class.

## 2 Materials

For this activity you will need:

1. White boards (or alternatively, flip chart paper)
2. Markers
3. Magic Carpet problems 1 and 2 from the IOLA Materials.

## 3 Instructions

This activity will take approximately 120 minutes.

1. Form groups of 3 to 4 students, give students handouts, and explain the goals of the activity.
2. Before answering any questions on the handout, ask students to discuss in groups, “What is the problem asking? What is vector notation?” After around 5 minutes, start a discussion with the whole class about these question.
3. Ask students to work on the handout. As students work on the problems, visit each group to answer any questions they may have.
4. Ask students to start creating a poster to represent their thinking. Emphasize that the poster should make sense all on its own.
5. When students are done, organize a gallery walk for students to look at each other’s work.

6. After part 1, ask students to work on part 2.
7. Afterwards, ask students to discuss:
  - (a) Cool strategies they noticed, and any patterns in the different strategies.
  - (b) What it was like to work in a group.
  - (c) The possibility of a consensus answer amongst students.

## **4 Tips**

1. Consider having graph paper available for students who want to create precise drawings.
2. If any groups complete their poster and explanation for the Magic Carpet part 1 then pass out part 2 to that group for them to consider.
3. If one group finishes particularly early, consider additional questions you could ask them such as: What if you had a third mode of transport? Would it be useful? What if you're only used to each mode of transport once? How many modes of transport do you need if you're in 3D space? Why?