

# Tips for Pair Programming



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[CSTeachingTips.org/Tips-for-Pair-Programming](https://CSTeachingTips.org/Tips-for-Pair-Programming)

**1 Explain pair programming goals**  
to motivate students to work together.

Pair programming  
can help you learn  
more efficiently.

**2 Assign roles and computers**  
to avoid unnecessary pair negotiations.

The partner on  
the left will be the  
navigator first.

**3 Pair students with similar skills**  
to avoid one student dominating the collaboration.

Find your  
assigned pair  
programming  
buddy!

**4 Name common behaviors**  
to encourage productive pairing interactions.

Navigators: are  
you offering  
suggestions or  
commands?

**5 Automate role-switching & timing**  
to facilitate role-switching compliance.

When the music  
plays – stand up  
and switch roles.

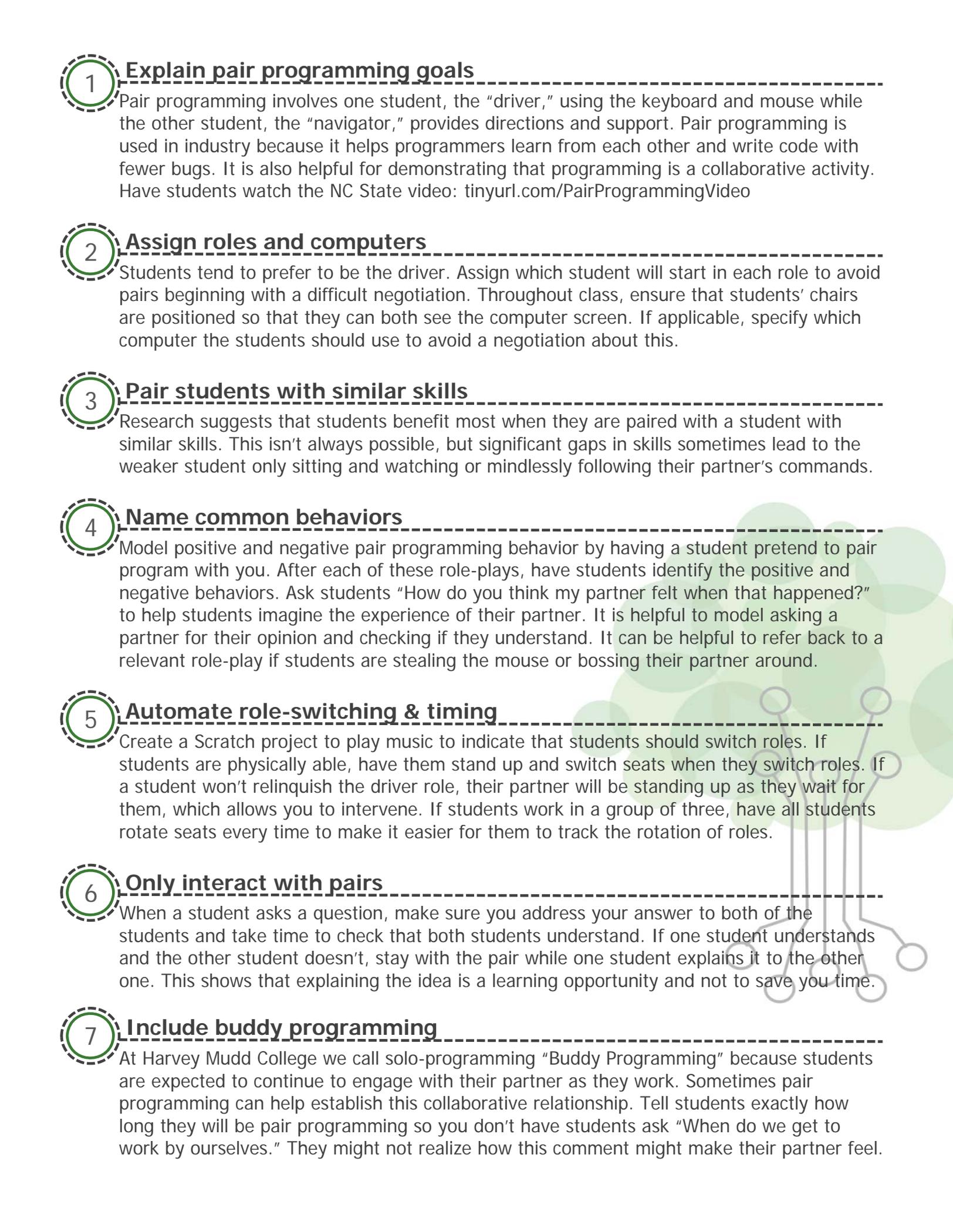
**6 Only interact with pairs**  
to support students in working together.

Have you and  
your partner  
discussed your  
question?

**7 Include buddy programming**  
to provide students autonomy and reduce frustration.

In 30 minutes  
we'll switch to  
buddy  
programming!

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1

## **Explain pair programming goals**

Pair programming involves one student, the “driver,” using the keyboard and mouse while the other student, the “navigator,” provides directions and support. Pair programming is used in industry because it helps programmers learn from each other and write code with fewer bugs. It is also helpful for demonstrating that programming is a collaborative activity. Have students watch the NC State video: [tinyurl.com/PairProgrammingVideo](https://tinyurl.com/PairProgrammingVideo)

2

## **Assign roles and computers**

Students tend to prefer to be the driver. Assign which student will start in each role to avoid pairs beginning with a difficult negotiation. Throughout class, ensure that students' chairs are positioned so that they can both see the computer screen. If applicable, specify which computer the students should use to avoid a negotiation about this.

3

## **Pair students with similar skills**

Research suggests that students benefit most when they are paired with a student with similar skills. This isn't always possible, but significant gaps in skills sometimes lead to the weaker student only sitting and watching or mindlessly following their partner's commands.

4

## **Name common behaviors**

Model positive and negative pair programming behavior by having a student pretend to pair program with you. After each of these role-plays, have students identify the positive and negative behaviors. Ask students “How do you think my partner felt when that happened?” to help students imagine the experience of their partner. It is helpful to model asking a partner for their opinion and checking if they understand. It can be helpful to refer back to a relevant role-play if students are stealing the mouse or bossing their partner around.

5

## **Automate role-switching & timing**

Create a Scratch project to play music to indicate that students should switch roles. If students are physically able, have them stand up and switch seats when they switch roles. If a student won't relinquish the driver role, their partner will be standing up as they wait for them, which allows you to intervene. If students work in a group of three, have all students rotate seats every time to make it easier for them to track the rotation of roles.

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## **Only interact with pairs**

When a student asks a question, make sure you address your answer to both of the students and take time to check that both students understand. If one student understands and the other student doesn't, stay with the pair while one student explains it to the other one. This shows that explaining the idea is a learning opportunity and not to save you time.

7

## **Include buddy programming**

At Harvey Mudd College we call solo-programming “Buddy Programming” because students are expected to continue to engage with their partner as they work. Sometimes pair programming can help establish this collaborative relationship. Tell students exactly how long they will be pair programming so you don't have students ask “When do we get to work by ourselves.” They might not realize how this comment might make their partner feel.