

Passwords 2: Creating a Good Password

Grade Level: 4-5

Objectives:

1. Students will learn how to make good passwords.

Materials:

Four copies of Team Identification Cards, "How to Write a Good Password" handout

Introduction:

Discuss with the students why it was easy for the other companies to figure out their passwords in Passwords 1. *The passwords were all very simple and contained only four different characters.*

Activity:

1. Have the students return back to their groups from Passwords 1.
2. This time have the groups create a new password that contains at least eight characters. Instruct the students to make sure that there is at least one character that is not a letter (either a number or some type of punctuation mark). Instruct the students that they should also include some capital and lowercase letters in their password.
3. Have the students complete the

activity as they did in Passwords 1.

4. For each incorrect guess the teacher still puts a portion of that team's password up on the board to share with the other companies.
5. After one team has guessed all of the other teams' passwords, or the students are becoming too frustrated to continue, end the activity and have a discussion with the students.

Closing:

Discuss with the students why this time it was much harder to access the other teams' secret information. What changes in the activity made it more difficult to figure out the other teams' passwords? Construct a list on the board of ways to create a "good password," and what things not to include in a password. Remind students that it is also good to change passwords on a regular basis, and not to use personal information in the passwords. Discuss with students why to use different characters and how the more characters you use and the number of characters in each password affects how easy it is to crack.

Possible Password Combinations:

Possible Characters in Password	Number of Characters in Password	Formula	Number of Possible Password Combinations
0-9	4	10^4	10,000
0-9	8	10^8	100,000,000
0-9 & 26 letters	4	36^4	1,679,616
0-9 & 26 letters	8	36^8	2,821,109,907,456

Supplemental Materials:

http://itim.tamu.edu/good_passwords.shtml

This website will provide teachers with information on how to write a good password.

Indiana Academic Standards:

Grade 4:

Language Arts:

4.7.1 Ask thoughtful questions and respond orally to relevant questions with appropriate elaboration.

Math:

4.6.1 Represent data on a number line and in tables, including frequency tables.

4.6.2 Interpret data graphs to answer questions about a situation.

4.6.3 Summarize and display the results of probability experiments in a clear and organized way.

4.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.

4.7.8 Make precise calculations and check the validity of the results in the context of the problem.

4.7.9 Decide whether a solution is reasonable in the context of the original

situation.

4.7.10 Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.

Grade 5:

Language Arts:

5.7.5 Clarify and support spoken ideas with evidence and examples.

Math:

5.7.3 Apply strategies and results from simpler problems to solve more complex problems.

5.7.4 Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.

5.7.8 Decide whether a solution is reasonable in the context of the original situation.

5.7.9 Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.

5.6.3 Understand that probability can take any value between 0 and 1, events that are not going to occur have probability 0, events certain to occur have probability 1, and more likely events have a higher probability than less likely events.

Team Identification Cards:

Hover Builders and Co. Password: _____

Your company has figured out how to make the “Hover Craft” float in the air. Come up with a password and then return all four copies of this card back to the teacher. Remember your password should be 8 characters long and should contain at least one character that is not a number. After giving the teacher your password try to figure out the other teams passwords. Remember if you guess incorrectly a portion of your company’s passwords will be shared with the other companies.

Hover Car Inc. Password: _____

Your company has figured out how to make the “Hover Craft” move forward. Come up with a password and then return all four copies of this card back to the teacher. Remember your password should be 8 characters long and should contain at least one character that is not a number. After giving the teacher your password try to figure out the other teams passwords. Remember if you guess incorrectly a portion of your company’s passwords will be shared with the other companies.

The Hover Craft Company Password: _____

Your company has figured out how to make the “Hover Craft” move backwards. Come up with a password and then return all four copies of this card back to the teacher. Remember your password should be 8 characters long and should contain at least one character that is not a number. After giving the teacher your password try to figure out the other teams passwords. Remember if you guess incorrectly a portion of your company’s passwords will be shared with the other companies.

Flying Vehicles Inc. Password: _____

Your company has figured out how to make the “Hover Craft” stop once it is moving. Come up with a password and then return all four copies of this card back to the teacher. Remember your password should be 8 characters long and should contain at least one character that is not a number. After giving the teacher your password try to figure out the other teams passwords. Remember if you guess incorrectly a portion of your company’s passwords will be shared with the other companies.

How to Write a Good Password:

1. Use a minimum of 6 characters.
2. Use a combination of numbers (1-9), alphanumeric characters (A-Z), and special characters (!, @, #, \$, %, ^, &, *, +, =).
For example: Get>Sm@rt.
If it is hard for you to remember special characters, create a common substitute that makes sense to you. For example, use \$ as a substitute for s or S. Or use + as a substitute for t or T. So instead of Get>Sm@rt, the password could be Ge+>\$mar+
3. Don't pick a password that someone can easily guess. What types of things are easy to guess? Here's a list of things that we advise you not use because they are easy to guess.
 - Don't use your login name in any form (as-is, reversed, capitalized, doubled, etc.).
 - Don't use your first or last name in any form.
 - Don't use the name of anyone in your family (even your pets).
 - Don't use other information easily obtained about you. This includes license plate numbers, telephone numbers, social security numbers, the name of your school's mascot, the name of the team you play for or the activity that you're in, the brand of your parents' car, the name of the street you live on, etc.
 - Don't use a password of all digits, or of all the same letter. This significantly decreases the search time for a cracker.
 - Don't use a word contained in (English or foreign language) dictionaries, spelling lists, or other lists of words.
4. Use a pass phrase. A pass phrase is sort of like a personal code. The phrase makes it easy for you to remember, but hard for someone else to guess.
For example: The title of the song "I Left My Heart in San Francisco" is a phrase that could be represented as the following password: EYELMHISF.
5. Use a separate password for different accounts. I know this makes it tough to remember multiple passwords. Try associating the password with the account. If you have an account to purchase books on line, use a pass phrase that is derived from a book title.
For example: Using the book title The Seven Habits of Highly Effective People could result in the following password: 7Hof^EP!
6. Do not write down your password and leave it in an easy to view spot.
7. Change your password regularly and don't reuse passwords that you have already used.
8. Do not give other people your password, intentionally or unintentionally. While it might seem like a good idea to give your friend your password so s/he can get a file off of your computer, your friend might write your password in a location where other people who are not your friends can find it. You also want to make sure that it is difficult for others to see you type in your password.
9. Close programs when you leave your computer.
10. Report any suspicious or abnormal circumstances to an adult that you trust as soon as you notice it.