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ID Plan
2-Digit Subtraction

1. **The Problem**. What is the problem you are trying to solve with your program? Don't tell me what you need, don't tell me what you will do—just describe the problem. What is wrong?

In second grade students learn subtraction, followed by 2-digit subtraction. The concepts of 2-digit subtraction can be difficult for some students because extra steps need to be taken, especially compared to addition of 2 digits. When subtracting a 2-digit number, in the ones column the bottom number may be larger than the top number. Most students feel like they can just take the difference of the two numbers, which is incorrect. Borrowing is a new concept at this stage of learning. It is new to these students and the reason for doing it doesn't seem easy to grasp.

It is important to understand this concept with 2-digit numbers before they can move onto larger numbers. The concept needs to be understood before the learner can move onto complex problems, which can involve addition and subtraction of various numbers within a wide range. With mastery of the skill of borrowing, students will be able to subtract any number imaginable.

2. **The Need**.

There are several needs that this program must address in order to make it appropriate for this group of students. First, the subject needs to be related to real world events or experience in some ways. With this connection, students will know why it is important that they know how to use the skills and it gives incentive for learning the skills. Some math topics seem abstract to students when they don't understand why they need to know the material. Also, with examples of real world situations they can use background knowledge to help enforce material and remember the skills through the connections.

This program also needs to help students understand the concept of borrowing and learn why it is important to understand it. This may seem like a tedious step to some students when actually it should teach the concept that one ten is the same as ten ones, and they can be interchanged if necessary. In this case it is also important to understand that a larger number can't be taken away from a smaller number, which is the reason for borrowing and extra ten ones.

Finally, the subtraction problem needs to be set up correctly. Columns need to line up properly so the ones are in the ones place and the tens are in the tens place. If a one-digit number is subtracted by a two digit number, then the one digit number needs to be placed all the way to the right. The larger number always needs to be placed above from the smaller number otherwise the subtraction won't work.

3. **The Audience**. This project is designed for second graders in a suburban setting who are struggling with 2-digit subtraction. These lower level students are having a hard time of grasping the concept of borrowing, which is resulting in incorrect answers. This program would be used as another method of instruction in trying to increase understanding of the subject. They understand the concept of subtracting and can subtract 2 numbers with at least 85% mastery. One-on-one instruction will help the learner understand the concept they are struggling with; borrowing.

This program can also be used for second graders who are beginning to learn 2-digit subtraction to practice more after their initial introduction to the subject. This program would be used to bridge the gap between learning and mastery of 2-digit subtraction.

4. **Objectives**.

At the end of this program, learners will have a greater understanding of 2-digit subtraction and the concept of borrowing. They will be able to determine when borrowing is appropriate and when it is not necessary. Learners will be able to construct and solve their own problems in the correct format and come to the correct solution. They will be able to collect information from word problems, formulate a problem, and correctly solve it. Students will then need to compare the answer to the question and determine if the result makes sense. This can be accomplished by checking your work, by adding the answer with the smaller number

in the problem to get a result of the larger number. Learners will need to recognize when it is appropriate for them to borrow and when it is not necessary.

These are the main objectives of 2-digit subtraction, so it is important that students master these skills before moving onward. With practice and multiple use of the program students will gain a better understand of the skills they need to know to be successful with subtraction.

5. **Content**.

The type of content being taught in this program is the concept of 2-digit subtraction. The program will include instruction of the topic followed by practice. The instruction will be step-by-step procedures of how to solve a 2-digit subtraction problem with borrowing and not borrowing. The practice which can be completed in any order will allow the learner to practice 2-digit subtraction by creating their own problem, format a problem correctly, and use real world examples with temperature and grocery shopping.

The concepts for this program will have been taught previously to the use of this program, and the material is used as a refresher or another way of presenting the material. With multiple exposures to the concepts of 2-digit subtraction, there is a greater likelihood that the learner will take in the information properly.

6. **Instructional Strategies**.

For this program I will use the character as a guide for teaching the concepts. She will begin by introducing the learners to the topic, objectives, and how to use the program. Through direct instruction, she will continue by showing how to solve the problems with a few examples. The first example will be on how to set up the subtraction problem. This problem will not involve borrowing. A next problem will be on how to solve examples that involve borrowing. The character will explain the importance of borrowing and how it needs to be used properly in order to get the correct answer.

In the next portion of the program, the learners will be given practice problems that they can complete in any order that they choose. This will help enforce the material they just learned. The character will help the students if they need it, and will give feedback after each problem they try.

7. **Additional Materials**.

Practice worksheets in this case would be the best way to continue learning this new skill. Once the concept is learned and understood, practice is the best way to enforce what was learned and become a pro at the skill. This concept needs to become automatic for students to become successful as they continue through their education and further.

There are several internet sites that have practice with subtraction that would be useful for this group of students. These sites give another form of practice that would be useful in practice of the subject.

8. **Program Use**.

This program will be for independent use by the students after they have already been introduced to 2-digit subtraction. This will be used as a practice and another way of enforcing the material. The program will give students immediate feedback as they complete the practice problems so they can adjust their understanding of the concepts. This program should be used as a stepping-stone from initial learning of 2-digit subtraction, to further practice and mastery. This will continue to be used by students who are struggling with the concepts of 2-digit subtraction and bridge the gap in their understanding.

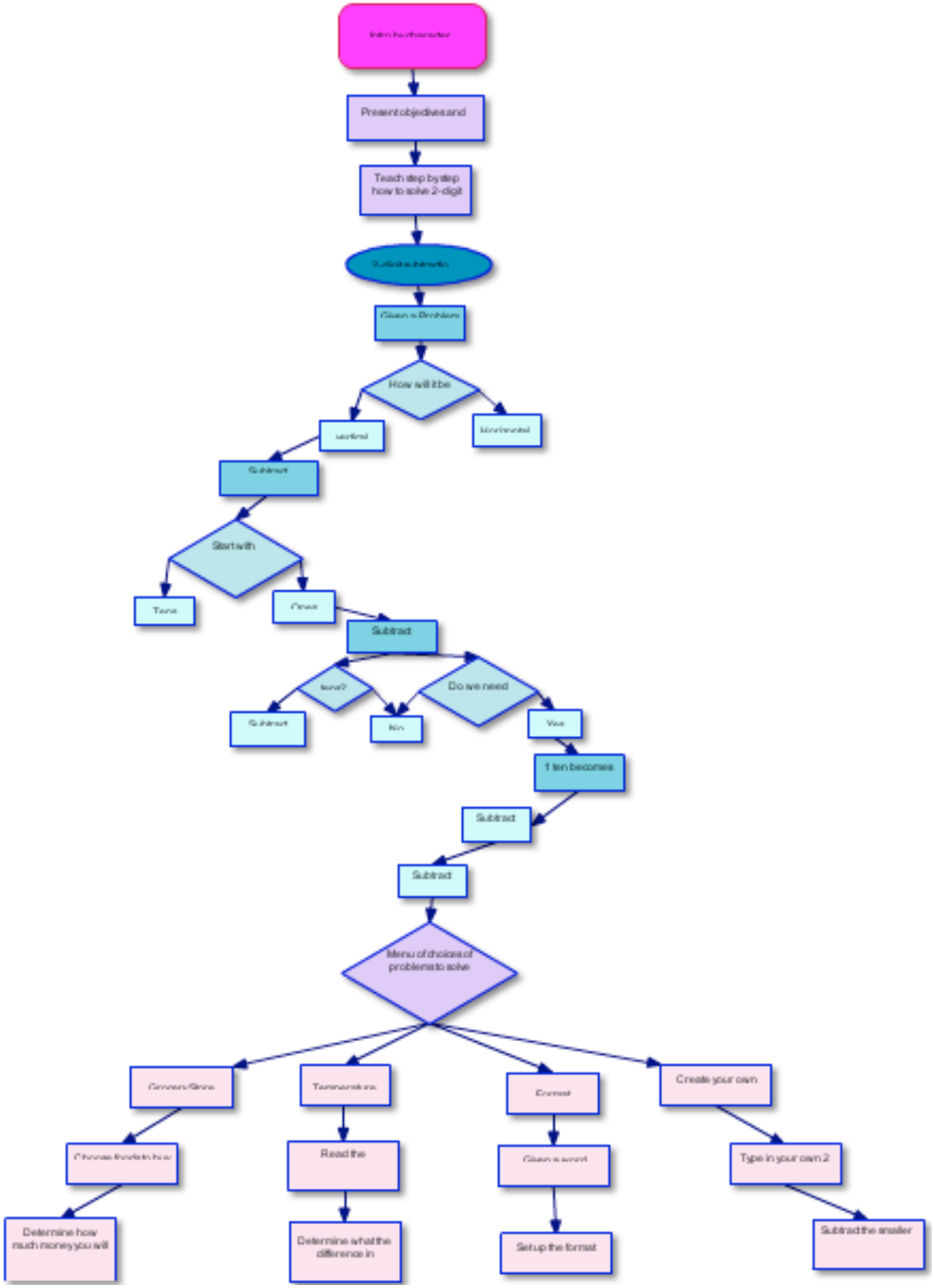
9. **Evaluation**.

Prior to students' use of the program, it will be determined if they need the further instruction or not, based on their understanding of concepts during instruction. They will have participated in class discussions and completed worksheets during the lesson to determine this.

Students will be given practice worksheets after they compete the program. Problems will include examples with and without borrowing. This will force students to use what they learned in the program to determine what problems they will need to borrow with and which ones they will not. For the problems students are required to borrow with, they will be evaluated on their ability to borrow properly. These worksheets will be viewed by the teacher to determine if further instruction is needed, and to determine the success of the program.

10. **Appendices.**

A. Storyboard



B. Worksheet for program evaluation:

Name _____

Directions: Complete all of the subtraction problems. Make sure you check to see if you need to borrow or not.

15 - 3	27 -12	36 -17
66 -38	24 -19	37 - 8
42 -31	81 -24	75 -66
47 -29	35 -17	64 -42