Task: The Necklace Task	**1st Grade**

Etta, Lily, and Carmen were making necklaces with beads.

A. Etta used 25 blue beads in her necklace. She added 6 sparkly beads to her necklace. How many total beads are in her necklace? Write an equation to represent the number of beads on Etta's necklace. Use a picture, diagram, or model to prove that your answer is correct.

B. Lily used 25 pink beads in her necklace. She added 7 sparkly beads to her necklace. How can you use what you know about the number of beads in Etta's necklace to help you find the number of beads in Lily's necklace?

C. Carmen used 25 yellow beads in her necklace. She added 8 sparkly beads to her necklace. How can you use what you know about the number of beads in Lily's necklace to help you find the number of beads in Carmen's necklace?

D. How can you use what you know about the number of beads in Etta's necklace to help you find the number of beads in Carmen's necklace?

Teacher Notes:

Flexible methods of computation involve taking numbers apart and combing numbers in a wide variety of ways. Students may solve the initial addition problem (25 + 6 = ☐) using various strategies and should be able to use a drawing, diagram, or picture to justify the answer. Additionally, students are asked to recognize that the first addend remains the same while the second addend is increasing by one, therefore, the sum will also increase by one. Students may be able to solve the problem without the noticing these relationships but requiring students to generalize about the numbers and the solutions provide opportunity for students to develop algebraic thinking.

A student page is provided at the end that can be printed for students.

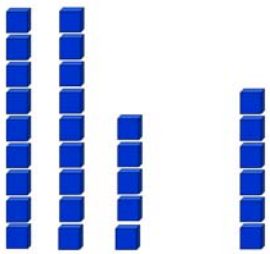
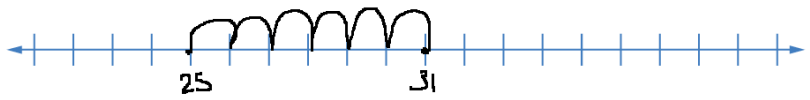
Common Core State Standards for Mathematical Content	**Common Core State Standards for Mathematical Practice**
1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.

Essential Understandings

Decomposing and recomposing sets in systematic ways can help you solve problems quickly and notice relationships among quantities. (Fact Strategies – Make a Double, Make a Ten; 5 + 4 = 4 + 4 + 1, 4 + 5 = 5 + 5 -1)

Problems can be solved by counting all, counting on from a quantity, counting on from the largest set, or using derived facts when solving for the whole amount or the missing part of the whole.
Analyzing a story problem prior to solving it to determine if the result should have more, less, or be about the same amount may help you determine if your response is reasonable or if it makes sense.

Explore Phase

Possible Solution Paths	**Assessing and Advancing Questions**
<u>Direct Modeling</u> Student counts 25 objects and 6 additional objects to get a total of 31 objects. Student determines that Etta has 31 beads on her necklace.  25 + 6 = 31 Student continues to use direct modeling and determines that Lily has 32 beads and Carmen has 33 beads.	<u>Assessing Questions:</u> What do the numbers represent in the equation? Why did you choose to count all of the cubes? <u>Advancing Questions:</u> How many more beads does Etta have than Lily? How do you know? How many more beads does Lilly have than Carmen? How do you know? How many more beads does Carmen have than Etta? How do you know?
<u>Counting On</u> Student begins with the number 25 and counts on 6 more to get a total of 31. This could be represented on a number line, hundreds chart, or with other models.  25 + 6 = 31	<u>Assessing Questions:</u> Why did you choose to start at 25? How did you know to jump 6 spaces? <u>Advancing Questions:</u> How many more beads does Etta have than Lily? How do you know? How many more beads does Lilly have than Carmen? How do you know? How many more beads does Carmen have than Etta? How do you know?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

25 + 6 = 31

After determining that 25 + 6 = 31, students can see that each girl adds one more bead than the previous. The start is 25 and each jump is one more than the previous problem.

Student determines that Etta has 31 beads. Lily has 32 beads (one more than Etta). Carmen has 33 beads (one more than Lily/two more than Etta).

<u>Decomposing/Recombining</u>

Student identifies the equation to represent this story situation as 25 + 6 = ?.

Student decomposes the numbers in one of the following possible ways: (other strategies are possible)

25 + 6 = (20 + 5) + 6
25 + 6 = 20 + (5 + 6)
25 + 6 = 20 + 11
25 + 6 = 31

<u>Assessing Questions:</u>
Describe how you broke apart the number 25.
Describe how you broke apart the number 6.
How did breaking the numbers apart help you get your answer?

<table>
<tr>
<td>Etta has 31 beads on her necklace.
25 + 6 = 25 + (5 + 1)
25 + 6 = (25 + 5) + 1
25 + 6 = 30 +1
26 + 6 = 31
Etta has 31 beads on her necklace.

Student writes the following number sentences for each girl:

Etta: 25 + 6 = 31
Lily: 25 + 7 =
Carmen: 25 + 8 =

25 + 6
25 + 6 + 1
25 + 6 + 2

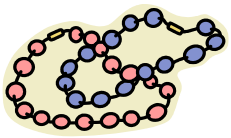
25 + 6
25 + 6 + 1
25 + 7 + 1

Student recognizes that each equation starts with 25 and each girl adds one more bead than the previous. Student determines that Etta has 31 beads, Lily has 32 beads (one more than Etta), and Carmen has 33 beads (one more than Lily).

Student also understands that Carmen has two beads more than Etta.</td>
<td>Advancing Questions:
How many more beads does Etta have than Lily? How do you know?
How many more beads does Lilly have than Carmen? How do you know?
How many more beads does Carmen have than Etta? How do you know?</td>
</tr>
<tr>
<td colspan="2">Possible Student Misconceptions</td>
</tr>
<tr>
<td>Student gets an incorrect answer because he/she miscounts or incorrectly decomposes a number.</td>
<td>Does the answer seem reasonable?
How could you check your answer?
Which girl do you think will have the most beads on her necklace? Why?</td>
</tr>
<tr>
<td>Student does not recognize the number sentence to represent an addition situation.</td>
<td>Use your own words to describe what is happening in the problem.
How could you use mathematics to combine the number of beads on each girl’s necklace?</td>
</tr>
<tr>
<td>Entry/Extensions</td>
<td>Assessing and Advancing Questions</td>
</tr>
<tr>
<td>If students can’t get started….</td>
<td>Describe what is happening in the problem.
Make a simpler problem using smaller numbers. How could this help you?
Which girl do you think will have the most beads on her necklace? Why?</td>
</tr>
<tr>
<td>If students finish early….</td>
<td>If each girl starts with 25 beads and Etta adds 6 sparkly beads, Lily adds 8 sparkly beads, and Carmen adds 10 sparkly beads. How could we use the number of beads in Etta’s necklace to help us find the number of beads in Lily’s necklace and Carmen’s necklace?</td>
</tr>
</table>

Discuss/Analyze
Whole Group Questions
• Describe an equation that I could write to find the total beads in Etta's necklace? Lily's necklace? Carmen's necklace? • Use your own words to describe how the number of beads each girl has in her necklace? Compare the number in each necklace. • How are the strategies used by our classmates alike and how are they different?

The Necklace Task



Etta, Lily, and Carmen were making necklaces with beads.

Etta used 25 blue beads in her necklace. She added 6 sparkly beads to her necklace. How many total beads are in her necklace? Write an equation to represent the number of beads on Etta's necklace. Use a picture, diagram, or model to prove that your answer is correct.

Lily used 25 pink beads in her necklace. She added 7 sparkly beads to her necklace. How can you use what you know about the number of beads in Etta's necklace to help you find the number of beads in Lily's necklace?

Carmen used 25 yellow beads in her necklace. She added 8 sparkly beads to her necklace. How can you use what you know about the number of beads in Lily's necklace to help you find the number of beads in Carmen's necklace?

How can you use what you know about the number of beads in Etta's necklace to help you find the number of beads in Carmen's necklace?