### Documentation for the teaching material »Entrance test grade 5«

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<th>SINUS I (1999) Lehrerkooperation</th>
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<tr>
<td>Authors:</td>
<td>2009 revised and adapted by Joachim Böttner and Jörg Triebel</td>
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<td>Target:</td>
<td>The accountability of 5th grade in the subject mathematics means a multitude of questions for the colleagues regarding the students’ prerequisites. This test should provide indications to the proficiency level and the professional-cognitive preconditions of the students.</td>
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| Organization form/time needed: | Part I: 120 basic tasks in the number range up to 100  
Time target: 8 minutes  
Part II: 12 tasks regarding basic knowledge up to grade 4  
Time target: 1 lesson (workig time: 40 minutes + 5 minutes introduction and reading time)  
Part III: 14 tasks with increased educational level  
Time target: 1 lesson (working time: 40 minutes + 5 min introduction and reading time) |
| Evaluation of the students' performances: | Grading of the papers is optional. If the teacher grades them, the parts should be assessed separately and the tasks should be weighed within a test part (new allocation of points).  
In this case, an inspection by parents (for example during the open house) should be possible.  
(In any case it should be evaluated and discussed with the students!) |
| Material Requirements: | It is recommended to copy the tests II and III on two sheets each to allow the students additional space on the back for solving the tasks.  
For a fast and detailed examination of the mental arithmetic tests solution templates are available. |
| Methodical Indications: | The test parts are realized by the students in independent activities. Before starting, it is definitely recommended to speak about the target of the testing tasks and respond to all questions and fears of the students. A healthy competition in the class can appear and serves as motivation.  
Before the mental arithmetic test a few training tasks can be worked on in daily exercises, because the students that did not get used to it in elementary school will fail the new methods since they cannot deal with the mathematical requirements.  
A student-auto-diagnosis sheet after the test parts is advisable. |
| Students' Materials: | Copies of the test tasks; auto-diagnosis sheet |
| Literature: | »Unterhaltsames Mathe-ABC«; Verlag Leipziger Volkszeitung  
Ideas of Johannes Lehmann: »2 mal 3 plus Spaß dabei«; Verlag Volk und Wissen |
Part I

120 tasks in the number range up to 100 in ............... minutes.

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Number of solved tasks: /30 p  Total points: /120 p

Part I – Assessment sheet

print on foil ➔ cut out light green fields ➔ correct and count

120 tasks in the number range up to 100 in ................. minutes.  n. sol. = not solvable

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Number of solved tasks: /30 p  Total points: /120 p

Part I – Assessment

An assessment can be given according to the calculation method.

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Part II

Last name: ___________________________  First name: ___________________________  Grade 5

Total points:  /40 p

1. Write out the number for eight hundred thousand fifty seven .................................................................

2. Calculate!
   a) 316 + 98 = ……………………
   b) 109 - 58 = ……………………
   c) 600 · 70 = ……………………
   d) 5600 : 700 = ……………………
   e) 4 · 0 · 16 = ……………………
   f) 120 : 0 = ……………………

3. Calculate!
   a) 7 + 3 · 11 = ……………………
   b) 15 - (3 + 5) = ……………………
   c) (5 + 15) : (6 - 2) = ……………………
   d) 5 · 6 - 3 · 4 = ……………………
   e) 5 · 4 · 6 = ……………………

4. Calculate!
   a) 2117 + 4935 + 504
   b) 2761 - 678
   c) 12901 - 3427 - 5658
   d) 8349 · 35

4. Calculate and check the result!

25677 : 9
   rough estimate  calculation  test
Part II

6. a) Calculate the ratio of 56 and 7. 

b) Give the number to which you have to add 29 to get 71.

7. Fill in the correct numbers!
   a) 650 + .......... = 910
   b) .......... : 6 = 90
   c) 41 - .......... > 39

8. Convert into the specified unit:
   a) 5 km = .......... m
   b) 20 000 g = .......... kg
   c) 3 h 15 min = .......... min

9. A truck can carry 3 tons of gravel in one ride. A building contractor orders 45 tons of gravel. How many loads are necessary?

   Calculate Answer

10. The Meyer family pays Euro 660 a month in rent for their apartment and Euro 40 for the garage. How much Euro does the family pay a total of per year?

    Calculate Answer

11. a) Draw the axis of reflection. 
   b) Add to the axially symmetric shape.

12. Which of the bodies are rectangular? Make a cross.
   A B C D E
Part II – Assessment

Last name: [ ] First name: [ ] Grade 5

Total points: /40 p

1. Write out the number for eight hundred thousand fifty seven 800 057

2. Calculate:
   a) 316 + 98 - 414  
   b) 109 - 58 - 51  
   c) 600 · 70 - 42 000  
   d) 5 600 · 700 - 8  
   e) 4 · 0 · 16 - 0  
   f) 120 · 0 - n. l.

3. Calculate:
   a) 7 + 3 · 11 = 40  
   b) 15 - (3 + 5) - 7  
   c) [5 + 15] · (6 - 2) - 5  
   d) 24 - 18 : 3 - 18  
   e) (5 + 4) · 6 - 54  

4. Calculate:
   a) 2 117 + 4 935 + 504  
   b) 2 761 - 678  

   2 117  
   + 4 935  
   + 504  
   = 7 556

   c) 12 901 - 3 427 - 5 658  
   d) 8 349 · 35  

   12 901  
   - 3 427  
   - 5 658  
   = 3 816

5. Calculate and check the result:
   rough estimate  
   25 680 : 10 = 2 568  
   calculation  
   25 677 : 9 = 2 853  
   test  
   2 853 · 9 = 25 677  

   1 point for each right result;  
   2 points for the right result: 1 point for the right multiplication, 1 point for the right addition;

   1 point for the right result,  
   1 point for a reasonable rough estimate,  
   1 point for the right test

/1 p
/6 p
/6 p
/5 p
/3 p
Part II – Assessment

<table>
<thead>
<tr>
<th>Last name:</th>
<th>First name:</th>
<th>Grade 5</th>
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</table>

6. a) Calculate the ratio of 56 and 7. \( 56 : 7 = 8 \)
   
b) Give the number to which you have to add 29 to get to 71? \( 71 - 29 = 42 \)

7. Fill in the correct numbers!
   a) \( 650 + 260 - 910 \)
   b) \( 540 \div 6 = 90 \)
   c) \( 41 - 0; 1 > 39 \)

8. Convert into the specified unit.
   a) \( 5 \text{ km} = 5000 \text{ m} \)
   b) \( 20000 \text{ g} = 20 \text{ kg} \)
   c) \( 3 \text{ h } 15 \text{ min} = 195 \text{ min} \)

9. A truck can carry 3 tons of gravel in one ride. A building contractor orders 45 tons of gravel. How many loads are necessary?
   Calculate \( 45 : 3 = 15 \)
   Answer \( 15 \text{ loads are necessary.} \)

10. The Meyer family pays Euro 660 a month in rent for their apartment and Euro 40 for the garage. How much Euro does the family pay a total of per year?
    Calculate
    \( (660 + 40) \cdot 12 = 8400 \) or \( 660 \cdot 12 + 40 \cdot 12 = 8400 \)
    Answer \( \text{The Family pay 8,400 Euro total per year.} \)

11. a) Draw the axis of reflection.
    b) Add to the axially symmetric shape.

12. Which of the bodies are cuboids? Make a cross.
   
   A \( \square \) B \( \square \) C \( \square \) D \( \square \) E \( \square \)
Part III

1. Complete the sequence of numbers.
   a) 7, ………, 21, 28, 35
   b) 4, 7, ………… , 13, 16
   c) 1, 4, 9, 16, ………… , 36

2. »How old is this oak tree?« asks Jan the forester. »Just think about it«, he replied mischievously. »Add up the largest single-digit number and the biggest two-digit number, and the largest three-digit number. Subtract off this sum the smallest four-digit number. Then you know how old the oak tree is.« Give Jan the answer and explain how you got it.

3. How many squares and triangles do you recognize?
   ………… squares
   ………… triangles

4. The Erfurt Theater has 426 seats. For a student performance 287 tickets are already sold. One school wants to have 78 tickets, another school 52. Can both schools get their tickets? Explain.

5. During a field trip, Jörg has sketched half of a gable and then at home he completed the rest of the drawing axially symmetric. But, he has made a mistake. Help him and mark these.

6. Which wording is correct, »9 and 7 is 15« or »9 plus 7 equals 15«? Give a reason.

7. Birgit is younger than Jutta, but older than Heike. Jutta is younger than Christiane. Place the names in order by age.
Part III

8. On the blackboard is written: $25 + 17 + \bigcirc + 12 + \bigcirc + 18 = 100$

Which of the two equal numbers are missing at the position of the spots?

Answer: ............. and .............

9. a) How many cubes have to be inserted so that the cube is complete?

b) How many cubes are built up here?

10. Before an exhibition, a rabbit weighs in at 1.75 kg. How much weight should be gained if the ideal weight of 2500 g is to be reached? Make a cross.

A 0.75 kg  B 5.25 kg  C 12.5 g  D 23.25 kg  E 750 g

11. Which of the six figures should logically be in the place of the question mark? Make a cross!

12. Each stated letter stands for a number. Find out the missing numbers!

$E + R + I + K + A = 350$  $E = R : 40$  $K = A \cdot 3$  $R = K + A$  $A = 280 : 7$

E = .............  R = .............  I = .............  K = .............  A = .............

13. Divide the following field by 3 straight lines in exactly 5 fields.
In each field there should be 2 smileys.

14. Put the numbers 1, 1, 2, 2, 3, 3, 3 that way in the square so that the numbers 1, 2 and 3 appear only once in every row and column. Find different possibilities!
Part III – Assessment

1. Complete the sequence of numbers.
   a) 7, 14, 21, 28, 35  
   b) 4, 7, 10, 13, 16  
   c) 1, 4, 9, 16, 25, 36

2. "How old is this oak tree?" asks Jan the forester. "Just think about it," he replied mischievously. "Add up the largest single-digit number and the biggest two-digit number, and the largest three-digit number. Subtract off this sum the smallest four-digit number. Then you know how old the oak tree is." Give Jan the answer and explain how you got it.

   \[(9 + 99 + 999) - 1000 \]
   \[= 1107 - 1000 \]
   \[= 107\]

   Die Eiche ist 107 Jahre alt.

3. How many squares and triangles do you recognize?
   - 5 squares
   - 10 triangles

4. The Erfurt Theater has 426 seats. For a student performance 287 tickets are already sold. One school wants to have 78 tickets, another school 52. Can both schools get their tickets? Explain.

   Several solution approaches possible:
   
   There are still 9 tickets left.
   
   Yes, both schools can receive their tickets.

5. During a field trip, Jörg has sketched half of a gable and then at home he completed the rest of the drawing axially symmetric. But, he has made a mistake. Help him and mark these.

6. Which wording is correct, "9 and 7 is 15" or "9 plus 7 equals 15"? Give a reason.

   Non of the claims are true because \(9 + 7 = 16\).

7. Birgit is younger than Jutta, but older than Heike. Jutta is younger than Christiane. Place the names in order by age.

   Birgit, Jutta, Birgit > Heike, Jutta < Christiane  
   Heike, Birgit, Jutta, Christiane
Teil III – Bewertung

8. On the blackboard is written: $25 + 17 + \_ + 12 + \_ + 18 = 100$

$$\frac{(100 - (25 + 17 + 12 + 18))}{2} = \frac{(100 - 72)}{2} = \frac{28}{2} = 14$$

Which of the two equal numbers are missing at the position of the spots?

Answer: 14 and 14

9. a) How many cubes have to be inserted so that the cube is complete?

15

b) How many cubes are built up here?

$6 \cdot 6 \cdot 4 = 144$

$144 - 15 = 129$

10. Before an exhibition, a rabbit weighs in at 1.75 kg. How much weight should be gained if the ideal weight of 2.5 kg is to be reached? Make a cross.

A $0.75$ kg  B $5.25$ kg  C $1.250$ g  D $23.25$ kg  E $7.50$ g

1 point for right addition, 1 point for figuring out the difference to 100, 1 point for cutting in halves

11. Which of the six figures should logically be in the place of the question mark? Make a cross!

1 point for the right solution, 1 point for defining the total number of the cubes when completed, 1 point for the right difference with a)

12. Each stated letter stands for a number. Find out the missing numbers!

E + R + I + K + A = 350
E = R : 40
K = A \cdot 3
R = K + A
A = 280 : 7

A = 280 : 7 = 40
K = 40 \cdot 3 = 120
R = 120 + 40 = 160
E = 160 : 40 = 4

I = 350 - (40 + 120 + 160 + 4) = 26

1 point for A, 1 point for K, 1 point for R, 1 point for E, 1 point for I

13. Divide the following field by 3 straight lines in exactly 5 fields. In each field there should be 2 smileys.

1 point for 2 smileys only, 1 point for 3 straight lines only, 1 point for 5 fields only

14. Put the numbers 1, 1, 2, 2, 2, 3, 3, 3 that way in the square so that the numbers 1, 2 and 3 appear only once in every row and column. Find different possibilities!

1 point for completing each square

*= characteristic