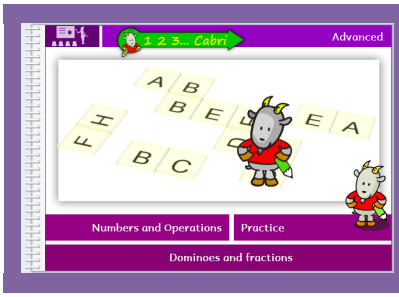
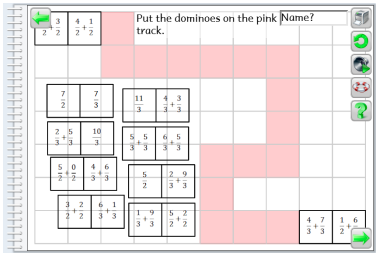


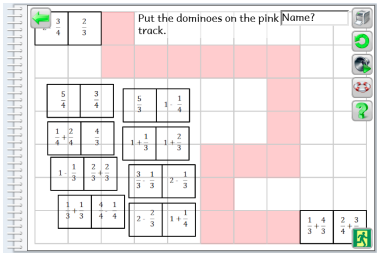
Dominoes and fractions
Numbers and Operations– Practice

Learning Objectives	To recognize the equivalence between a fraction and a sum (or difference) of fractions with the same denominator, to know how to add simple fractions with the same denominator, to add (or subtract) a simple fraction to (from) a whole number.
Short Description	The pupil must construct a path of dominoes holding constant sums of simple fractions, or sums (or differences) of a whole number and a simple fraction.
Use in Classroom	One or two pupils at a computer, classroom use on Interactive Whiteboard
Contribution of *1 2 3... Cabri*	Exploration, Interactivity, Autonomy The pupil can access at any moment two help pages that offer two linked dynamic representations of the sum of fractions with same denominator or the sum (or difference) of the whole numbers 1 or 2 and a fraction. The pupil can vary the common denominator and the numerators. The resource provides feedback validating or invalidating the path of dominoes constructed by the pupils who can work independently.
When and how to use?	The activity book can be used after fractions, addition and subtraction of fractions with the same denominator have been introduced. To put a domino next to another one, there are several choices, mainly at the beginning of the construction of the path. There may be a discussion among two or more pupils to choose the appropriate candidate. There may be disagreement about the computation. The access to the help page may solve this disagreement. This activity book encourages exchanges among pupils. It can be done in the class under the control of the teacher with an Interactive Whiteboard. Or pupils in pairs at a computer can do the activities and then the teacher can organize a class discussion for sharing the strategies and the calculations.

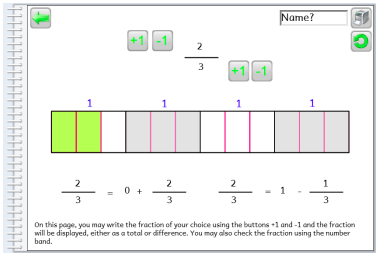
Some snapshots



Construct a path of dominoes.



Same task with dominoes holding other fractions.

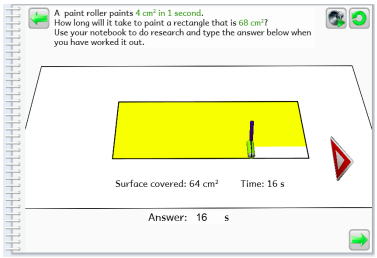


Help page accessible from all pages

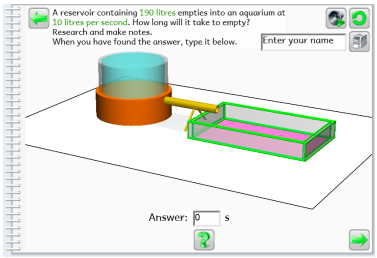
Proportionality
Handling data – Discovery

Learning Objectives	To calculate the missing number in a proportion, using different methods.
Short Description	Five real world problems are given in various contexts involving different magnitudes (quantities in litres, distances in cm, areas in $cm^{2)}$ and flow in l/s, or speed in cm/s or cm^2/s). All problems deal with the calculation of a missing number in a proportion. The pupils must model the real situation with the adequate proportion and calculate the missing number. There are several possible methods: additive methods, multiplicative methods and calculation of the proportionality coefficient.
Use in Classroom	One or two pupils at a computer, classroom use on Interactive Whiteboard
Contribution of *1 2 3… Cabri*	Simulations, Interactivity, Randomly generated data The pupils can observe through the simulations how the real situation unfolds with their answer. The activity book offers a bridge between the real world and mathematics. Feedback brings information to the pupils about their answer: the answer is a too large or too small number, additional numerical data are provided. Each page can be regenerated with new numerical data. The pupils can repeat the activity book with different data and practice different strategies.
When and how to use?	This activity book can be used at the beginning of the learning of proportionality in order to introduce the calculation of a missing number in a proportion and the proportionality coefficient. It can be used in the class with an Interactive Whiteboard. The pupils share and discuss different strategies. It can be used with two pupils working at a computer. Then the teacher can organize a class discussion about different ways of solving the problems and introduce the notion of proportionality coefficient. The activity book can then be repeated for practicing.

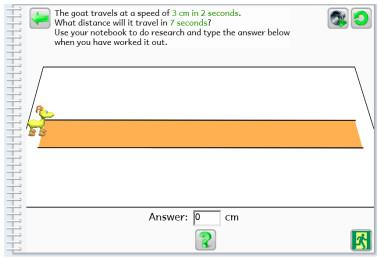
Some snapshots



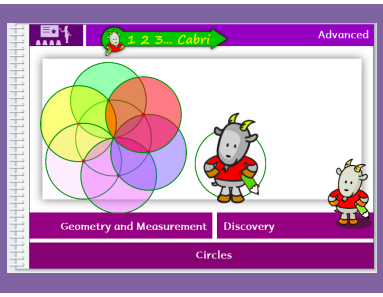
Example of a task. Checking the answer prompts a dynamic simulation of the roller painting the area during the time given in the answer.



Similar task in a context of reservoir. Same dynamic feedback.



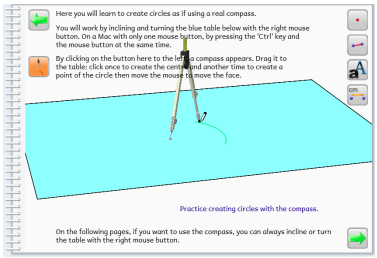
Another task with more complex calculations. Same dynamic feedback.



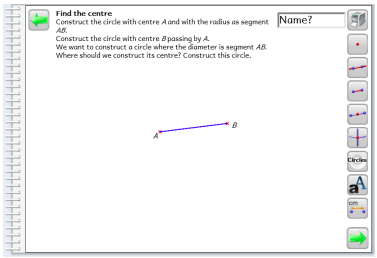
Circles
Geometry and Measurement – Discovery

Learning Objectives	To create circles with given centre and radius or with given centre and passing through a given point. To use circles as tool in solving construction problems.
Short Description	The pupils learn how to use the Cabri tools and the “Realistic compasses” in order to construct circles. Then they must solve three construction problems of increasing difficulty: construct points remaining at 4 cm from a given point even when this latter point is dragged, constructing a circle with diameter a given variable segment, constructing a point at given distances from two points which can be dragged.
Use in Classroom	One or two pupils at a computer, classroom use on Interactive Whiteboard
Contribution of *1 2 3… Cabri*	Dynamic Geometry, 2D and 3D. The tools allow the pupils to construct diagrams, which vary when one of their elements is dragged. They can be aware of the difference between a diagram drawn by just using the perception and a diagram constructed by using geometric properties. In this activity book, the circle tool allows the user to obtain points at the same distance from a point or at a given distance from a point. The pupils can tilt the plane and work like in their notebook on a table. They can move continuously from 2D to 3D and conversely.
When and how to use?	The activity book can be used once circles are introduced. It can be done in two or three steps: a first time to learn how to use the tools, a second and third time to solve the problems. Since the problems are not easy, the teacher can organize a class discussion after each problem, in which pupils share their strategies. This class discussion also gives the teacher the opportunity of demonstrating the difference between a diagram created by only resorting to perception and a diagram constructed by using geometric tools.

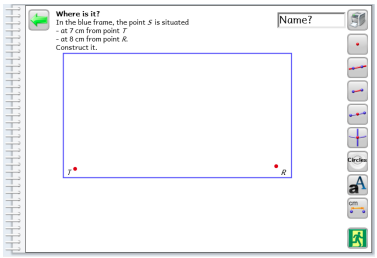
Some snapshots



Learn how to use the pair of compasses.



Example of a geometrical task: construct a circle with given diameter.

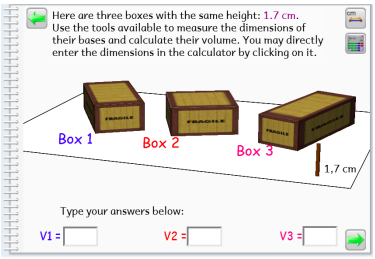


Another task: construct a point at given distances from two points.

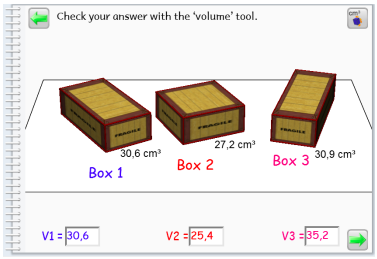
The big case
Geometry and Measurement – Discovery

Learning Objectives	To know how to apply the formula which calculates the volume of a slab.
Short Description	The pupils must calculate the volume of three slabs with given height. They can measure the sides of their base by using the Length tool. Then they must compare the volume of 3 slabs with same height. They must understand that the volumes of the slabs are arranged in the same order as the areas of their bases. If the answer of the pupils is wrong, they can access to a page where they can vary the common height of 3 slabs and observe that the volumes always are in the same order.
Use in Classroom	One or two pupils at a computer
Contribution of *1 2 3… Cabri*	Manipulation in 3D, Interactivity, Autonomy, Dynamic Geometry The problem is posed as if it were given with real objects. The pupils have themselves to decide what to measure in order to calculate the volume of the slabs. They can move the boxes, they can turn or tilt the table to change their perspective. Feedback validates or invalidates their answers. The activity book can be used in autonomy. In case of a wrong answer in the comparison of the volume of 3 slabs with same height, the pupils go to a page in which they can vary the common height of the slabs with a cursor and see the effect on the volumes.
When and how to use?	The activity book can be used once the pupils know the formula for the volume of a slab. The page demonstrating the invariance of the order in which volumes are arranged, when their common height varies, can be used by the teacher for stimulating a discussion about the reasons underlying this invariance.

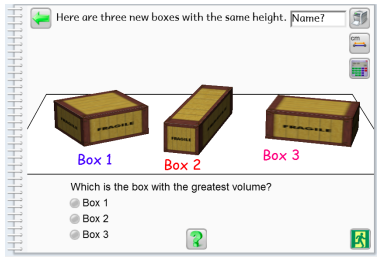
Some snapshots



Measure the edges of each box and calculate their volume.



The answers can be checked on the next page by measuring the volume of each box with the Volume tool.



Another task: compare the volume of three boxes with same height by measuring the sides of their base.