

Analyzing Integration Elements in Numbers and Operations in The Grade 5 Mathematics Textbook in Vietnam

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ABSTRACT: This paper analyzes the integration elements in the Numbers and Operations strand of the Grade 5 Mathematics textbook through document research and analysis of illustrative exercises. The content is examined according to three forms: intra-subject integration, inter-subject integration, and trans-subject integration. The analysis results show that intra-subject integration is clearly reflected through the connection between numbers, operations, measurement, and statistics. Inter-subject integration is identified through data, contexts, and knowledge belonging to other subjects. The potential for trans-subject integration is reflected in practical tasks that require mobilizing a synthesis of knowledge and skills to build a solution. The paper emphasizes the role of organizing learning tasks in exploiting the integration elements of the textbook.

KEYWORDS: Numbers and Operations, Grade 5 Mathematics, integration, textbook, integrated teaching.

1. INTRODUCTION

Integrated teaching creates opportunities for students to connect knowledge and skills and apply them to solving problems in learning and in life. In Grade 5 Mathematics, the Numbers and Operations strand has considerable potential for integration through its relationships with other content strands, other subjects, or practical situations. Exploiting these relationships helps clarify the meaning of mathematical knowledge while creating conditions for developing students' capacity to apply it. However, the presence of practical data or images in an exercise is not by itself sufficient to determine the level of integration; the role of these elements within the learning task must also be considered. Therefore, analyzing the integration elements in the textbook provides a basis for teachers to select content and organize appropriate activities. This paper analyzes the manifestations of intra-subject, inter-subject, and trans-subject integration in the Numbers and Operations strand of the Grade 5 Mathematics textbook under study, thereby clarifying the potential for exploiting the content in an integrated direction.

2. CONCEPTIONS AND FORMS OF INTEGRATION IN MATHEMATICS

a) Conception

"In its ordinary sense, integration is associated with the action or process of assembling and connecting the components of one object or several inter-related objects to create unity and completeness"[2].

"Integrated teaching is an orientation of teaching that helps students develop the ability to mobilize a synthesis of knowledge, skills, etc., from various different fields to effectively solve problems in learning and in life, carried out during the very process of acquiring knowledge and practising skills" [1].

b) Forms of integration in Mathematics

The Numbers and Operations content in the Grade 5 Mathematics textbook accounts for 50% of the instructional time, corresponding to approximately 88 periods. In the Grade 5 Mathematics textbook, the Numbers and Operations content is not presented as an independent system of knowledge. The concepts of natural numbers, fractions, decimals, ratios, percentages, and operations are usually placed in relation to other mathematical content strands, to the knowledge of other subjects, and to practical problems that are meaningful to students.

The three forms of integration in Mathematics include:

- Intra-subject integration: connecting the Numbers and Operations content with other strands of Mathematics such as Geometry and Measurement, Some Elements of Statistics and Probability, or mobilizing multiple pieces of knowledge within the Numbers and Operations strand itself in the same task.
- Inter-subject integration: using the knowledge, data, or methods of other subjects such as History and Geography, Science, Technology, Informatics, Physical Education, Fine Arts, and Ethics to form and apply mathematical knowledge.

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- Trans-subject integration: organizing a task around a comprehensive practical problem, in which students must mobilize mathematical knowledge, social understanding, life experience, tools, communication, cooperation, and decision-making capacity to create a product or a solution.

3. INTEGRATION ELEMENTS IN THE NUMBERS AND OPERATIONS CONTENT OF THE GRADE 5 MATHEMATICS TEXTBOOK

3.1. Intra-subject integration between Numbers and Operations and other content strands

Integrating the content of natural numbers and operations with natural numbers with the measures of quantities learned in primary school. The textbook presents situations that integrate natural numbers when representing measures of quantities, using natural numbers and decimals to represent measures of area.

Example 1. Write the following area measures in hectares [3].

- a) 25,000 m² 412,000 m² 8,000 m²
b) 11 km² 7.5 km² 0.48 km²

Regarding the Numbers and Operations content, students must recognize the structure and value of natural numbers and decimals, and apply division by 10,000 when converting from square metres to hectares and multiplication by 100 when converting from square kilometres to hectares. The conversion process helps consolidate the skill of multiplying and dividing natural numbers and decimals by 10, 100, 1,000, and 10,000, especially the rule for shifting the decimal point and handling cases where the result has a decimal part.

Regarding measurement, the exercise helps students consolidate their concept of the square metre, the hectare, and the square kilometre, the relationships among units of area, and the selection of an appropriate unit to express areas of different scales. By comparing the measures before and after conversion, students recognize that when converting to a larger unit the numerical measure decreases, while the actual area of the object does not change.

Next, natural numbers and operations with natural numbers are also integrated in a problem related to financial education. The problem integrates the content of natural numbers and rounding natural numbers within financial education through a situation of determining and rounding a shop's revenue.

Example 2. "At the end of the day, the shopkeeper said: 'The shop's revenue for the whole day was about 2,500,000 đồng.' In fact, the shop's revenue for the whole day was 2,545,000 đồng.

- a) To which place value did the shopkeeper round the revenue?
b) Round the shop's actual revenue to the nearest ten thousand" [3].

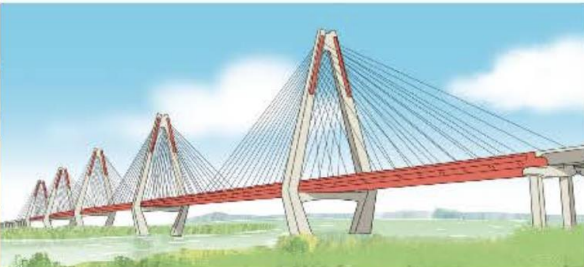
Regarding mathematical knowledge, students apply the way of reading natural numbers, determine the value of each place, and carry out rounding to the nearest ten thousand and the nearest hundred thousand. From the actual revenue of 2,545,000 đồng, students recognize that the shopkeeper rounded to the nearest hundred thousand to get 2,500,000 đồng; when rounding to the nearest ten thousand, the result is 2,550,000 đồng. Through this, students understand that the accuracy of an approximate number depends on the place value chosen for rounding.

The financial-education element is reflected in the context of sales revenue and the way an amount of money is represented by an approximate number. The problem helps students begin to understand that revenue is the total amount of money a shop earns from its sales activity over a given period of time, while also distinguishing actual revenue from estimated revenue. Students recognize that rounding amounts of money makes financial information more concise, easier to remember, and more convenient for reporting or planning, but that a rounded figure does not reflect the actual amount of money with complete accuracy.

Through comparing 2,545,000 đồng with 2,500,000 đồng and 2,550,000 đồng, teachers can help students develop the capacity to read and understand financial information, estimate monetary values, choose an appropriate level of rounding, and check the reasonableness of a result. The problem also contributes to educating honesty, accuracy, and responsibility when providing, recording, and using financial data. In this way, the knowledge of rounding numbers is not only consolidated within Mathematics but is also applied to managing money and to economic situations close to everyday life.

Next, decimals are integrated within measurement content when expressing technical specifications in real life. For example, introducing the technical specifications of the Nhật Tân Bridge.

Figure 1. Nhật Tân Bridge (Hanoi, Vietnam)

Total length	9.17 km	
Main bridge section	3.9 km	
Section crossing the Red River	1.5 km	
Approach section	5.27 km	

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Integrating knowledge of decimals with measurement content through data describing the length of each section of a bridge. The measures include: a total length of 9.17 km, with the main bridge section measuring 3.9 km, the section crossing the Red River measuring 1.5 km, and the approach section measuring 5.27 km. Placing decimals in the context of a transport structure helps students see that decimals are used to accurately express measures of quantities that are not natural numbers.

The content reflects the integration of decimals, operations, and the measurement of length in real life. Presenting information through a data table combined with an image helps students develop the capacity to read and understand data, to compute with decimals, and to apply mathematical knowledge to learning about transport structures in everyday life.

Example 3. "As of 2022, World Athletics recorded a number of athletics records as shown in the following table:"[3]

Distance	Record
100 m run	9.58 seconds
200 m run	19.19 seconds

(Source: Worldathletics.org)

"Round the above records to:

- a) The nearest tenth.
- b) The nearest whole number" [3].

The problem reflects the integration of decimals with the quantity of time through real data on the 100 m and 200 m running records. The results of 9.58 seconds and 19.19 seconds are both decimals and time measures, in which the second is the unit of measurement. Through this, students see that decimals are used to express measurement results that require high precision, which natural numbers cannot fully reflect.

Regarding the Numbers and Operations content, students apply their knowledge of the structure, place, and value of the digits in a decimal, and carry out the rule for rounding to the nearest tenth and to the nearest whole number. The problem helps students understand that a time-measurement result can be represented with different levels of precision. The original data is recorded to the nearest hundredth of a second, while the result after rounding shows only an approximate time to the nearest tenth of a second or the nearest second. The greater the degree of rounding, the simpler the representation, but the lower the precision.

The problem, set in the context of athletics records, also helps students read and understand data tables, compare results, and apply mathematics to process real information. Teachers can guide students to recognize that in professional sports competitions, even a very small fraction of a second can affect the ranking, so the precise figure must be kept unchanged when determining results; rounded figures are mainly used for presentation or estimation. The integration element is reflected in the use of knowledge of decimals and rounding to process time measures.

In addition, numbers and operations with decimals are also integrated with measures of mass in everyday life.

Example 4. "A group of polar bears has 10 cubs, each of which eats 4.5 kg of fish per day. How many kilograms of fish do the 10 cubs in that group eat altogether each day?" [3].

The problem reflects the integration of decimal numbers and measures of mass through the situation of calculating the amount of fish eaten by the group of polar bears in a day.

Regarding the Numbers and Operations content, students consolidate the rule of shifting the decimal point one digit to the right when multiplying a decimal by 10. The number 4.5 is not only a decimal but also represents a measure of mass in kilograms. Students must read the measure correctly as "four point five kilograms," carry out the calculation with the measure, and write the appropriate unit for the result. This connection helps students see that decimals are used to represent measures that are not natural numbers, such as 4.5 kg. The problem is an example of intra-subject integration between the Numbers and Operations strand and the topic of Measurement.

In addition, percentages are integrated with elements of statistics. For example, a chart of the numbers of students who favour four sports is used to calculate percentage values. Students read the chart, determine the data for each group, and then carry out calculations. A percentage is understood as a way of standardizing data on a base of 100, supporting the description of composition and the comparison of groups.

Example 5. "The chart below shows the results of a survey on the preferences of some students for four sports"[3].

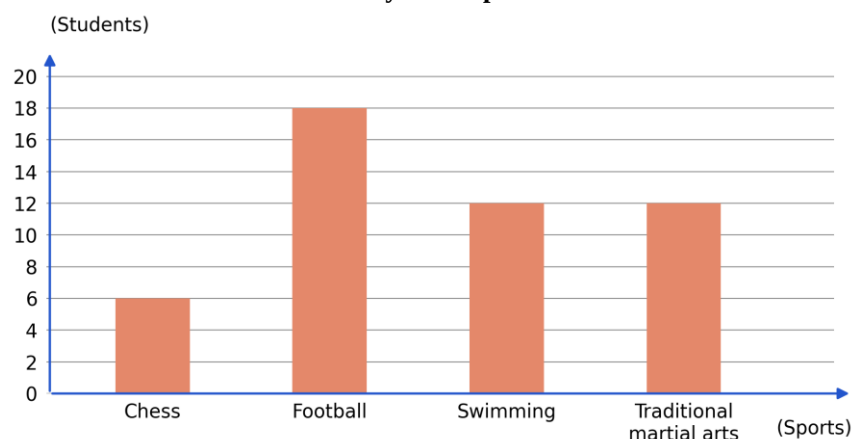


Figure 2. Results of the survey on preferences for four sports

"a) How many students favour each sport?

b) Find the percentage of the number of students who favour each sport relative to the total number of students surveyed."

The problem reflects the integration of natural numbers, percentages, and elements of statistics through a bar chart representing the results of a survey on students' sporting preferences. From the height of the bars, students can read the data: chess is favoured by 6 students, football by 18 students, swimming by 12 students, and traditional martial arts by 12 students.

Regarding natural numbers and operations, the numbers 6, 18, 12, and 12 represent the number of students who favour each sport, that is, the frequency of each surveyed group. Students must use addition to determine the total number of students surveyed:

$6 + 18 + 12 + 12 = 48$ (students).

This result serves as the basis for carrying out percentage calculations. Through this, students see that knowledge of natural numbers and addition does not exist in isolation but is used as a tool for aggregating statistical data.

3.2. Inter-subject integration through the Numbers and Operations content in Grade 5

First, integration with History and Geography through images and lesson content. For example, the textbook provides information on the height of mountain peaks, the area of certain places, and scenic sites, etc., so that teachers can integrate an introduction to geographic location and scenery, etc.

Example 1. Choose the correct answer [3].

Phong Nha - Kẻ Bàng National Park has an area of 123,326 ha (Source: phongnhakebang.vn)

The area of that national park in square kilometres is:

- A. 12.3326 km²
- B. 123.326 km²
- C. 1,233.36 km²
- D. 12,332.6 km²



Figure 3. Phong Nha- Kẻ Bàng [4]

The problem uses the units of square kilometre and hectare to provide information about the area of Phong Nha - Kẻ Bàng National Park. The problem requires reading, writing, and converting area measures. Natural numbers and decimals become tools for representing the park's area in hectares and in square kilometres. Through the problem, students understand the meaning of these two units of measurement.

Teachers organize students to do the exercise, then integrate an introduction to the geographic location of Phong Nha - Kẻ Bàng National Park. The integrated content is as follows: "Phong Nha - Kẻ Bàng National Park (Quảng Trị province) is located in the centre of the North Central Coast region of Vietnam, southwest of the Gianh River; to the west and southwest it borders the Lao

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People's Democratic Republic; to the north it borders Kim Phú commune (Quảng Trị province); to the east and southeast it borders Trường Sơn commune (Quảng Trị province). The National Park shares a boundary with the Hin Namno Nature Reserve of the Lao People's Democratic Republic"[4].

Example 2. Match the area measure with each place named below [3]:

Bạch Mã
National Park

Thái Hoà Palace

Thừa Thiên Huế
Province

5,054 km²

22,031 ha

1,360 m²

Teachers integrate an introduction to the places named in the exercise, namely Bạch Mã National Park, Thái Hoà Palace, and Thừa Thiên Huế province, now Huế City. The integrated content may be as follows:

"Bạch Mã National Park is a primeval forest lying along the Trường Sơn range and stretching across the country, from the Vietnam-Laos border toward the East Sea. Bạch Mã National Park is one of the well-known tourist destinations of Huế City" [5]	 <i>Figure 4. Bạch Mã National Park (Huế)[5]</i>
"Thái Hoà Palace is the most important architectural work in the royal citadel of the Nguyễn dynasty. Thái Hoà Palace is the largest, most stately, and most magnificent palace in the complex of Huế Ancient Capital monuments.	 <i>Figure 5. Thái Hoà Palace [6]</i>

The Complex of Huế Monuments was recognized by UNESCO as a World Heritage Site in 1993" [6].

The textbook provides information on the lengths of Long Biên, Nhật Tân, Cầu Thơ, and Bãi Cháy bridges, which serves both as data for comparing decimals and as a source of understanding about transport structures in different regions of Vietnam. Mathematics becomes a means of describing the scale of these structures and supports geographic-spatial awareness. At the same time, the textbook introduces the heights of Mount Everest, Bà Đen Mountain, and Olympus Mons on Mars, which are used for practising the reading and comparison of natural numbers. The geographic and scientific data are not merely decorative but form the basis for interpreting results, helping students simultaneously picture the scale of natural objects on Earth and beyond it.

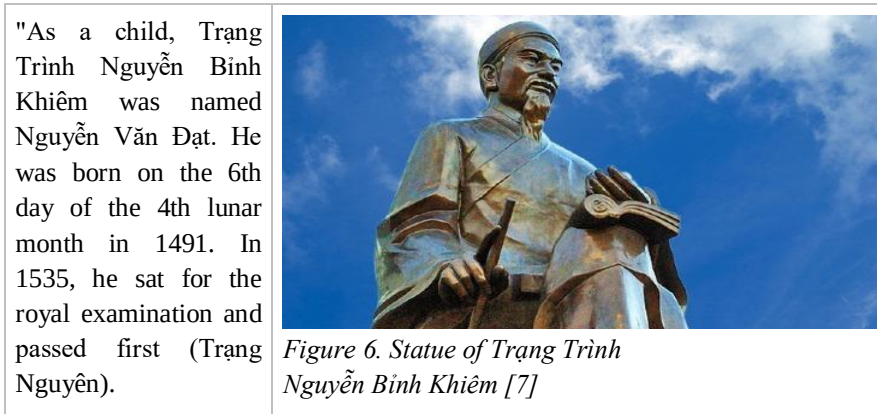
The Grade 5 Mathematics textbook also has a type of exercise related to a map of an area of Ho Chi Minh City, showing a park, a railway line, and the distances between locations on the map according to scale. Students read the legend, measure lengths, determine two corresponding quantities, and calculate the actual distance. Ratios, multiplication, and division are applied to solve practical situations.

Next, natural numbers are used to determine historical dates; from this information, the task can be extended to determining the century and placing a figure on a timeline. The exercise connects natural numbers with an understanding of notable figures and Vietnamese culture.

Example. "Trạng Trình Nguyễn Bình Khiêm was born in 1491. From this year, how many more years will it be until the 600th anniversary of the birth of Trạng Trình Nguyễn Bình Khiêm is celebrated?" [3]

Teachers organize students to solve the problem and determine

Teachers can integrate an introduction to the historical figure Nguyễn Bình Khiêm as follows:



After his success, he was appointed to a number of posts and was granted the titles Trạng Trình Nguyễn Bình and later Trạng Trình Quốc Công, so he came to be popularly known as Trạng Trình" [7]

Second, this creates opportunities for teachers to teach Mathematics in an integrated direction with knowledge of Science, and with environmental education, traffic safety, and disease prevention.

Example. Choose the correct answer

There are three wall paintings.

The painting on environmental protection has an area of 5.3 m^2 .

The painting on traffic safety has an area of $5 \text{ m}^2 8 \text{ dm}^2$.

The painting on Covid prevention has an area of $5 \text{ m}^2 9 \text{ dm}^2$.



Figure 7. Propaganda paintings

Which painting has the smallest area?

- A. The painting on environmental protection.
- B. The painting on traffic safety.
- C. The painting on Covid prevention.

Through this problem, students observe propaganda paintings on environmental protection, traffic safety, and disease prevention that are used in a situation comparing the area measures of each painting. The context carries a message about science, health, and social behaviour. When teaching in an integrated way, teachers need to ask students to identify and discuss the message, avoiding letting the paintings serve only as illustrations.

For example, teachers can convey the following message to students:

- On environmental protection: "Let us join hands to protect the environment through practical actions: planting and caring for trees, not littering, conserving resources, and reducing smoke and dust. Protecting the environment is protecting our health and our lives."
- On traffic safety: "Strictly obey traffic laws: wear a helmet, keep to the correct lane, stop at red lights, and do not play around while taking part in traffic. Traffic safety is the happiness of every family."

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In relation to environmental-protection education, the textbook also includes exercises set in contexts related to planting trees and collecting waste, etc. Situations about tree planting or environmental activities use percentages to express the degree of completion of a plan. Percentage becomes a tool for evaluating the results of environmental-protection activities, thereby connecting Mathematics with Science and education for sustainable development.

The textbook has a type of exercise that creates an opportunity for teachers to integrate scientific knowledge through indicators of students' height and weight.

Example. "The standard height and weight of a 10-year-old child according to the World Health Organization (WHO) are as follows:" [3] (Source: marrybaby.vn)

	Height (cm)	Weight (kg)
Boys	137.8	31.2
Girls	138.6	31.9

Round the measures in the table to the nearest whole number.

The table of children's height and weight is used for rounding measures. Students understand the units of centimetre and kilogram, and that a rounded measure is an approximate value. In this way, students talk about approximate height and weight.

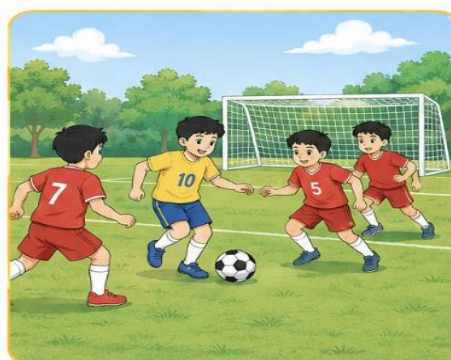
Through this problem, students apply mathematical knowledge of rounding decimals, integrated with content on health education and self-care skills. Students both learn to round measures of height and weight and become aware of the meaning of monitoring health in a scientific way. Teachers can integrate the following message to students: "Every student needs to pay attention to and monitor the development of their body by measuring height and weight periodically, while maintaining a reasonable diet, exercising regularly, getting enough sleep, and keeping clean in order to stay healthy. The figures are for reference only; each person develops at a different rate, so differences should be respected, and no one should compare or tease a friend about their appearance."

Third, the Numbers and Operations content in the textbook is integrated with Physical Education. Fractions represent the level of participation in badminton, football, volleyball, and basketball. The sporting context helps the operations of finding a common denominator and comparing fractions connect with questions that are familiar regarding students' preferences. The level of integration lies mainly in the data and context, and does not yet require in-depth knowledge of rules or movement technique.

Example. "The number of Grade 5 students participating in sports at the Sports Club of Kim Đồng Primary School is as follows:"[3]



Badminton: $\frac{1}{3}$ of the Grade 5 students



Football: $\frac{2}{5}$ of the Grade 5 students



Martial arts: $\frac{1}{5}$ of the Grade 5 students



Basketball: $\frac{4}{15}$ of the Grade 5 students

Figure 8. Illustration of the exercise content

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"Among the above sports, which one is participated in the most by the Grade 5 students of Kim Đồng Primary School?"[3]. Through the exercise, education on protecting the health of students who take part in sports activities at school is integrated.

Fourth, teaching Mathematics in a direction integrated with Fine Arts. A picture is divided into rectangular sections of different colours, creating a context for calculating dimensions or area. Students observe the composition, identify the shapes, and set up the calculation. The task shows that arithmetic and geometry can be used to analyze the structure of a visual-art product.

Example. "A rectangular map has a length of 8.4 m and a width of 6.5 dm.

a) The area of the map is ... dm².

b) Việt folds the map as shown in the picture below.

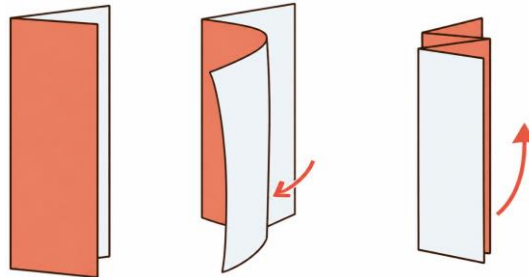


Figure 9. Illustration of the folding steps

After folding, the map becomes a smaller rectangle. The area of the smaller rectangle is ... dm²."

Finally, the mathematics textbook is integrated with Informatics and Technology through a system of exercises that use a calculator to compute percentages, find the percentage value of a number, or carry out addition, subtraction, multiplication, and division of natural numbers.

Practising the use of a calculator requires recognizing the keys, entering the calculation, and reading and checking the result. Students develop the capacity to use tools and means for learning mathematics. Students learn to use the correct sequence and to compare the calculator's result with an estimate, rather than relying entirely on the calculator.

Example. Practise using a calculator to compute the amount of money in the following situation:

"The Board of Management supports our class's charity fundraising plan by contributing to the fund an additional amount equal to 20% of our class's revenue from selling bracelets. Calculate the amount our class raised for the fund supporting disadvantaged children in the highlands" [3].



Figure 10. Illustration of the problem content

Through this problem, education on mutual affection and helping friends and people around them in life is also integrated for students.

3.3. Trans-subject integration through the Numbers and Operations content in Grade 5

The Grade 5 Mathematics textbook shows trans-subject integration through a number of activities connected to real life. For example, "The school plans to re-tile the floors of all the classrooms. The Grade 5 classes are assigned the task of measuring and calculating the floor area of their classrooms and estimating the cost of tiling the floor"[3].

"1. a) Measure and calculate the floor area of your classroom.

b) Calculate the amount of money needed to buy tiles to cover the floor of your classroom. The chosen tile is square-shaped with a side of 50 cm, packed in boxes of 4 tiles, each box costing 140,000 đồng" [3].

"2. Suppose the other classrooms in the school have the same floor area as your classroom. Calculate the amount of money needed to buy tiles to re-tile the floors of all the classrooms in your school" [3].

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The problem requires students to survey a real space, measure the classroom, calculate the area, look into materials and unit prices, and estimate the number of tiles and the cost. The task mobilizes mathematics, measuring skills, knowledge of materials, information-seeking, cooperation, presentation, and a sense of thrift.

The problem reflects an element of trans-subject integration through a comprehensive practical task: measuring the area of the classrooms and estimating the budget for buying tiles to re-tile the school floors. In this activity, the Numbers and Operations content is not carried out in isolation but becomes a tool for students to solve a real problem of the school community.

Regarding the Numbers and Operations content, students must mobilize a number of pieces of knowledge and skills at the same time: reading and recording measures; performing multiplication to calculate the area; converting units of measurement; dividing the floor area by the area of one tile; determining the number of boxes of tiles to buy; multiplying the number of boxes by the unit price of 140,000 đồng; and further multiplying by the number of classrooms to estimate the total budget. If the resulting number of boxes is not a whole number, students must round up, since it is not possible to buy a fraction of a box of tiles.

The trans-subject element is also reflected in the fact that the task goes beyond the scope of one specific subject. Students apply mathematical knowledge to measure and calculate; use Technology skills in selecting materials, determining packaging specifications, and building a plan; and apply financial education to draw up a budget, balance the costs, and choose a reasonable spending plan. Group work, the division of tasks, recording data, and reporting results also contribute to developing communication and cooperation competence in shared work.

The problem reflects trans-subject integration because the activity is organized around a complete practical problem — "planning to re-tile the classroom floors" — rather than starting from the content boundary of each subject. Students must combine knowledge, skills, and experience from many fields to create a shared product of practical significance: a table of area measures, a plan for buying tiles, and a budget estimate for the school.

In addition, discount situations require distinguishing between the listed price, the discount rate, the amount discounted, and the amount actually paid. Percentage is used in consumer decisions; students develop financial understanding, the ability to read advertisements, and to compare options.

Example. "Mother took Mai and Mi to a retail supermarket. At the children's section, they saw a sign that read: "In celebration of International Children's Day, June 1, all items are discounted by 15%." Mother bought Mai a school backpack priced at 250,000 đồng and bought Mi a stuffed animal that was very pretty, priced at 120,000 đồng. Calculate how much the backpack and the stuffed animal were each discounted by?



Figure 11. Illustration of the problem content

The problem reflects an element of trans-subject integration through a shopping situation and calculating the discounted amount on the occasion of International Children's Day. The Numbers and Operations content is not presented as pure calculation but is used to solve a consumption problem close to students' everyday life.

The trans-subject element is reflected first of all in the connection between Mathematics and financial education. Through the problem, students understand the listed price, the discount level, the amount discounted, and the actual amount to be paid; they learn to read information on an advertising sign and to check the payment result. Through this, students begin to develop smart-consumption competence, not equating "a 15% discount" with "a discount of 15,000 đồng," and learning to weigh the financial benefit before making a purchase.

The problem is also connected with life skills and ethics education. Students are placed in a context of shopping with a family member, from which they can discuss choosing necessary items, spending in line with the family's financial means, avoiding impulsive shopping, and being responsible when using money. Information about International Children's Day, June 1, also creates a link with social and cultural understanding.

The situation in the problem is oriented toward competencies that do not belong to a single subject, such as reading and understanding information, calculating, solving problems, making decisions, managing finances, and applying knowledge to life.

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Teachers can extend the task by having students draw up a shopping list within a given budget, compare promotional programmes, or choose the most reasonable purchasing option. In that case, students must mobilize a synthesis of knowledge and experience to solve a real consumption problem, further clarifying the trans-subject nature of the task.

The characteristic of trans-subject integration is fully expressed when teachers organize an extension activity in which students use knowledge from multiple fields to propose and choose an appropriate spending plan.

4. CONCLUSION

Through the analysis, intra-subject integration proves to be the most prominent and tightly connected form within the Numbers and Operations strand, especially in the relationships between decimals and measurement, fractions and visual geometry, and percentages with statistics and computation.

Inter-subject integration is reflected through material drawn from History and Geography, Science, Informatics and Technology, Physical Education, Fine Arts, and environmental and financial education. However, in some cases this goes no further than borrowing data or images; the level of integration is deep only when information from the other subject directly participates in the process of solving the task.

Trans-subject integration is clearest in practical, experiential activities such as tiling classroom floors, using a calculator, handling discounts, reading maps, and solving environmental problems. These are tasks that require students to use tools, cooperate, make decisions, and create practical solutions, in keeping with the orientation of the General Education Curriculum toward developing qualities and competencies.

REFERENCES

- 1) Ministry of Education and Training (2018), *General Education Curriculum, Mathematics Curriculum* (Issued together with Circular No. 32/2018/TT-BGDĐT dated 26 December 2018 of the Minister of Education and Training).
- 2) Nguyễn Thị Thu Hằng (2023), *Textbook on Integrated Teaching in Primary Education* [Giáo trình Dạy học tích hợp ở tiểu học], Vietnam Education Publishing House.
- 3) Hà Huy Khoái (Editor-in-Chief), Lê Anh Vinh (Chief Editor), Nguyễn Áng, Vũ Văn Dương, Nguyễn Minh Hải, Hoàng Quế Hường, Bùi Bá Mạnh (2025), *Toán 5* [Mathematics 5], Volume 1, Volume 2, Vietnam Education Publishing House.
- 4) <https://dsvh.gov.vn/di-tich-lich-su-va-danh-lam-thang-can-h-vuon-quoc-gia-phong-nha-ke-bang-2940>
- 5) <https://vinwonders.com/vi/wonderpedia/news/vuon-quoc-gia-bach-ma-hue/>
- 6) <https://hue.gov.vn/Du-khach/Thong-tin-du-khach/Kham-pha-Hue/tb/Dien-Thai-Hoa-619755>
- 7) <https://cauchuyenlichsu.vn/ky-uc-song-mai/trang-trinh-nguyen-binh-khiem-4fdd4f>



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