

**UKRAINE-GREAT BRITAIN: VARIOUS STRATEGIES OF
MATHEMATICAL PRE-UNIVERSITY TRAINING AND THEIR
EFFECTIVENESS IN FURTHER EDUCATION AND CAREER**

*Savchenko L.
National Aviation University*

The purpose of this study is to compare different approaches to pre-university training in mathematical knowledge in the Unighted Kingdom and Ukraine and analyze their effectiveness in the future life of a young person.

First of all, it should be recognized that any strategy or system of teaching, including mathematics, and including at school, has its advantages and disadvantages.

The purpose of this study is to compare different approaches to pre-university training in mathematical knowledge and analyze their effectiveness in the future life of a young person.

First of all, we will outline the general differences in the study of mathematics at school in the UK and Ukraine:

1. In the UK, there is no division into Algebra and Geometry. Teaching is carried out in blocks (or units), each of which is aimed at algebraic or geometrical tasks.

2. Schools in the UK have a certain autonomy in the scheme of presenting material to children. A school can choose to start with the second unit or study part of the material next year. The depth of study of the units can also vary.

3. As in Ukraine, upon graduation from school (Year 11, similar in age to our Year 12 at New Ukrainian School), students take a unified exam in mathematics (GCSE - The General Certificate of Secondary Education). It is identical throughout the country and is similar in style to the National Multi-Subject Test, although it is held at the child's home school.

4. One of the fundamental differences is the division of the difficulty of the math exam into Foundation and High Maths. The level that a child will take is determined by assessments (testing), which is actively carried out in Year 10 and Year 11.

5. Usually, in the UK, children are divided into levels (or sets) depending on their ability in math through a year. There can be five sets (from 1st - the highest, to 5th - the lowest). The transition between sets is possible, even within the school year, if the child shows results that do not correspond to their set. This transition is possible both to increase and to decrease the level.

6. After Year 11, some children go to colleges, and some remain at school in the so-called 6th form (or A-level) at school or college. Here they study for another two years, after which they can enter university. Subjects which children will study depends on their GCSE results and their desires. For example, in a school with 1,500 students, there may be about 150 children in the 6th form, and 20 of them study mathematics. Here, higher-level mathematics is studied, which is usually included in the Years 10-11 curriculum of a Ukrainian school. In addition, at this time, significant parts of mathematics are mechanics and statistics.

7. Lessons last on average 60 minutes, and no time is devoted to homework during the lesson. Homework is usually given once a week, and it consists of completing assignments on certain math website. The teacher has access to information about who did what assignment, and at what time, and accordingly can apply sanctions to those who do not do their homework.

8. The lesson begins with 10-15 minutes, during which children are given assignments on the topic or topics that they studied before in order to consolidate the knowledge and immediately begin work.

9. The curriculum is posted on the government website for everyone to see. It is divided into five main parts (Key Stages, KS1-KS5), the first two of which are taught in primary school (KS1-2 - Years 1-6), the next two in secondary school (KS3 - Years 7-8, KS4 - Year 9). During Years 10-11 students are studying Foundation or Higher Maths with consolidate all knowledge of KS1-4 to pass the GCSE (they can take one of the GCSE options - Foundation Maths or Higher Maths). At 6th form they study A-level Maths (KS5), after which they can enter a university. The curriculum is structured as a spiral, with children covering roughly the same topics each year, but at different levels of complexity or depth.

Let us now try to assess the advantages and disadvantages of the British system in relation to the Ukrainian one.

1. In our opinion, there is no particular difference in the allocation of Algebra and Geometry into separate subjects. Studying them in units (for example, a month of algebra, then a month of geometry) does not worsen, but does not improve the assimilation of the material. In this aspect, there are no advantages of one system over the other.

2. Autonomy in terms of the time of presentation of parts of a certain unit and even an entire unit, apparently, does not bring any particular advantage for schools and children. Subjectively, the Ukrainian system, in which schools are obliged to follow the scheme of presentation of topics in each academic year, is more understandable and does not require additional actions from either teachers or children. Problems arise especially acutely when children or teachers move from school to school within the school year. It should be added that the migration of children is significant everywhere in the UK and is the order of things. For example, up to 5% of students can leave and join a school each month. Therefore, adaptation to a

new school is accompanied by adaptation to a different learning scheme, which increases stress.

3. The British practice of taking a national exam at a child's base school is certainly more comfortable for the student. Equality and objectivity are achieved by the presence of special observers (invigilators), a significant part of whom are external and follow strict rules for conducting the exam. The examination papers are checked by an external organization, similarly as in Ukraine. Thus, the objectivity of assessment is achieved.

4. The idea of two levels of the math exam (the Foundation GCSE and High GCSE) seems very successful to us. Due to this division, children who find math difficult do not experience additional stress when studying complex topics. But those who have good results (often purely due to genetic predispositions) have the opportunity to show their best and not feel bored during lessons. Children who pass Foundation math (and get a passing grade, it is usually quite affordable) have the opportunity to go to college, Level 3. After good results in the Higher math exam, the child can choose to study math further in the sixth form. Admission to university is possible after both successful completion of two years of college (Level 3) and after sixth form exams. Each university sets different requirements for exam grades. The most prestigious universities require the highest grades, while less well-known ones are content with average or even low levels. However, the passing level, sufficient for admission to college, is not enough for admission to university.

5. The division into levels (or sets) by academic performance in the UK starts from Year 7. However, there are schools that refuse such division and have mixed ability classes. In general, the division into sets allows children to achieve their maximum in a comfortable environment. On the other hand, there are teachers that believe that this way children are limited in their knowledge. For example, a child may find algebra easy and geometry difficult, but they will be in a low ability set, which will not give them the opportunity to get the maximum knowledge of geometry. In our opinion, the division into sets by academic performance is apparently an effective strategy. Perhaps it is worth having not more than three sets - low, medium and high - and dividing children by placing them in a set with higher expectations.

6. In the UK, on average, about 10% pupils stay in school after Year 11. The rest go to college. This does not mean that no more than 10% get into higher education, because after college you can go to university too. The general idea of studying at a university is as a truly high level of education, which linearly correlates with future salary and career. That is, it is very unlikely that after university a person will work with the same salary and in the same position as a person after college. Studying mathematics in an in-depth format is not something strange or unnecessary. A person with good mathematical training will always find a good job, including after studying a mathematical specialty at a university. The positive thing is that a person

can always retake exams if they have the opportunity to brush up on their knowledge beforehand (including on numerous courses, many of which are free for families receiving benefits from the government).

7. The duration of a lesson in Ukraine is 15 minutes less than in the UK. And this makes life easier for both the child and the teacher. However, a significant amount of time spent on homework at school eats up part of the lesson. It is much more effective to direct the child to a website where, in addition to assignments, they can watch short videos on each topic. This way, independence, responsibility and self-motivation are developed. Parents do not need to sit in the evening and help with homework. If the child has not done homework for some reason, in most cases, they receive a sanction. On average, this is about 30 minutes after school, when a child stays at school. During this time, they can do homework, read, finish assignments in exercise-books, etc. The main thing is that the conditions of these 30 minutes are as working as possible, not involving communication with peers or teachers.

8. We believe that starting a lesson with a review of the topics covered is a good practice. Unfortunately, much here depends on the child's self-discipline and the authority of the teacher, since there are cases when the child simply sits out this time, waiting for the correct results to be shown and the nuances of the assignments to be analyzed. To some extent, this can be called an analogue of checking homework in a Ukrainian school, with the difference that the tasks are solved right in the classroom and discussed there.

9. The spiral structure of the British curriculum allows for repeated reinforcement of the material. As a result, by the time of exams, even very weak students usually have the amount of knowledge to enter college at a high level (Level 3). In addition, in the last two years (Y10-11), children go through the entire program required to pass GCSE exams. Ukrainian children who come to the UK with sufficient knowledge of English usually find it easier to study mathematics and pass the exam at a British school than in Ukrainian one.

Conclusion

To sum up, the British school education system has been built, adjusted, adapted and improved for centuries, so there is much to learn from it. The scheme for presenting material, assessing results and moving to another level of education is usually logical and comfortable. School does not teach what will never be useful. However, further knowledge of higher mathematics is never superfluous. The results of school exams, along with subsequent diplomas from college or university, will be indicated when applying for any job throughout the career. This directly proves the importance of school mathematical training for both subsequent education and for building a successful career.