The Framework Educational Programme was revised in the Czech Republic in 2021 to include the basic principles of the Internet and computer networks in teaching computer science at ISCED level 2. According to the new revision, primary schools are supposed to start teaching at ISCED 2 from September 2024 at the latest, however, they face a lack of suitable teaching materials on this topic for this students' age group. Therefore, this work addresses this gap by creating four model lessons and materials for students and teachers of the lower secondary school at two different levels of difficulty (grades 6—7 and grades 8—9). The aim of the lessons is to explain the structure and basic principles of the Internet. The content of the lessons is based on known student preconceptions. The theoretical background of the work is based on the constructivist perspective "Knowledge in Pieces", ERR framework and the model of teaching by analogy. The lesson plans and corresponding materials for both levels of difficulty were created and tested through the combination of action and design-based research in six schools (13 classes, 258—271 students in total). The students' knowledge was examined by means of pre-post testing. The results indicate a significant positive effect of our lessons immediately after the lessons ($d = 1.76$, $p < 0.001$, $n = 207$) as well as several months after the intervention ($d = 1.06$, $p < 0.001$, $n = 61$). The methodologies and materials in the appendix of the thesis are developed in such a way that the teachers can use them directly in lessons.