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Identifying students' mental models of the apparent motion of the Sun and stars

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To study to what extent students have insight in the Apparent Motion of the Sun and Stars (AMoSS), we have designed the AMoSS test instrument with 12 multiple choice questions, which focus on distinctions between the apparent motion of the Sun and stars. We administered the AMoSS test to students of the fifth year (16-17 years old) of 6 Belgian secondary schools (N=410) during a science lesson at school and asked them to explain their choices. The analysis of the answers on the multiple-choice questions and the written explanations, reveal that, despite instruction, most students only demonstrate a rudimentary understanding of the apparent motion of the Sun and stars for different locations of the observer and different times during the year. Even university students score poorly on the test. Thanks to the classification system, which we have developed to categorize the written explanations and a latent class analysis, we are able to identify different mental models that students have about the apparent motion of the Sun and stars.

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