

## The misconceptions in learning celestial sphere of students, science teacher students and science teachers.

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Teaching and learning astronomy is not effectively in class event in the University level. Because the concept of astronomy is abstract and complicate for students. Many of student teachers have difficulty of how to create their lesson to help students learn astronomy. Because of they are not confident in concepts of astronomy. Especially in the concept of celestial sphere, the concept is very complicate event teacher use their tools in class such as model and simulation to help student to learn. In learning celestial sphere, students have to use their 3D imagine to understand the concept. Therefore this study need to know how people learn celestial sphere concept by investigate their misconception by using the open-ended questions in many ways. The article summarized misconceptions in learning celestial sphere of Thai students, science teacher students and science teachers. The participate were 30 students in grad 11 of Khoksiwittayasan school in Sakhonnakhorn, 30 science education students in the 4th year of Khon Kaen University and 10 science teachers around North-East of Thailand. All of the participants had the experiment in learning celestial before doing the open-ended questions. The results found that students, teacher students and teachers had misconceptions in learning celestial sphere in many concepts such as 1) the maximum altitude of star was equal the altitude of Polaris 2) the stars rise up at the north-east and set down at the south-west when observe at latitude 10 degree north.

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