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SD4721

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（学校用）

様式 A-1

(FY2025)

2026年　1月　27日

サイエンス・ダイアログ　実施報告書

1. 学校名:
   愛知県立刈谷高等学校
2. 講師氏名:
   Ning HUAN 博士
3. 講義補助者氏名: 牧　千尋さん、東條　颯眞さん

4. 実施日時:　2026 年 1 月 23 日（金）　16:00 ～ 18:00

5. 参加生徒:　2年生 11人、（合計 11人）
   備考:（例:理数科の生徒）

6. 講義題目:
   次世代の乗り物とエネルギー
7. 講義概要:
   水素自動車の仕組みと導入の最適解について
8. 講義形式:
   ☑対面 ・ □オンライン （どちらか選択ください。）
   1) 講義時間　90分　質疑応答時間　30分

   2) 講義方法（例:プロジェクター使用による講義、実験・実習の有無など）
プロジェクターによる講義

   3) 事前学習
   □有 ・☑ 無 （どちらか選択ください。）
   使用教材:

9. その他特筆すべき事項:

For Web posting

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Form B-2
(FY2025)
Must be typed

Date（日付）
23/01/2026 （Date/Month/Year：日/月/年）

Activity Report -Science Dialogue Program-
（サイエンス・ダイアログ 実施報告書）

- Fellow's name（講師氏名）: Ning HUAN （ID No. P25046）

- Name and title of the lecture assistant（講義補助者の職・氏名）
牧 千尋 MAKI Chihiro, Master student at Nagoya University

- Participating school（学校名）: Aichi Prefectural Kariya High School

- Date （実施日時）: 23/01/2026 （Date/Month/Year:日/月/年）

- Lecture title（講義題目）:
Next-Generation Vehicles and Their Energy Systems

- Lecture format（講義形式）:
◆☒Onsite ・ □Online (Please choose one.)（対面 ・ オンライン）（（どちらか選択ください。））
◆Lecture time（講義時間） 60 min（分）, Q&A time（質疑応答時間） 30 min（分）
◆Lecture style（ex.: used projector, conducted experiments）
（講義方法（例：プロジェクター使用による講義、実験・実習の有無など））
プロジェクター使用による講義

- Lecture summary（講義概要）: Please summarize your lecture within 200-500 words.

This lecture presents an overview of next-generation vehicles (NGVs), including battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), and hydrogen fuel cell vehicles (HFCVs), together with the urban energy systems that support their operation. The lecture is designed to introduce key technologies and concepts related to NGVs and their role in urban decarbonisation. The first section presents major types of fossil fuels and renewable energy sources, their production pathways, and how energy flows within urban energy systems. Based on this background, the lecture introduces the main categories of NGVs and highlights their core technological characteristics, linking vehicle technologies to energy supply systems. The second section presents the differences between NGV powertrain mechanisms and those of conventional gasoline and diesel vehicles. It explains differences in energy conversion processes and energy-use efficiency and illustrates how NGVs contribute to achieving carbon neutrality. The third section presents the NGV market in Japan, highlighting regional differences in adoption. It further introduces hydrogen refuelling station layout design and presents empirical examples of event tree analysis and accident consequence analysis to illustrate safety assessment practices in

hydrogen infrastructure planning. The fourth section presents public acceptance of hydrogen refuelling infrastructure in Japan, Spain, and Norway. It outlines key pathways for acceptance cultivation and presents hydrogen station planning examples from the Kanto and Chubu regions to demonstrate how technical, spatial, and social factors are integrated in practice. The final section presents the relationship between NGVs and energy systems. It emphasises that the sustainability of NGVs depends on energy supply conditions and introduces vehicle-to-home (V2H) and vehicle-to-grid (V2G) concepts. The lecture concludes with examples of fuel cell vehicles serving as mobile power sources after earthquakes, illustrating how bidirectional vehicle–power grid connections can enhance the resilience of urban energy systems.

◆Other noteworthy information（その他特筆すべき事項）:

The lecturer was pleased to see that the students were able to understand the lecture content well. During the session, many students raised thoughtful questions. The lecturer considered this to be a highly meaningful activity and was delighted to share knowledge and latest research with high school students who are enthusiastic about science.

- Impressions and comments from the lecture assistant（講義補助者の方から、本プログラムに対する意見・感想等がありましたら、お願いいたします。）:

No additional comments.