Appendix

Table 1. Student Creativity Process Assessment Rubric

No	Indicators	Sub-indicators	explanation	Category	Rubric
1	Preparation	Collecting problems	Students can identify the problems associated with vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	Students **can determine the problem's topic, opinions, and facts** from the learning resources related to the subject matter.
				Good	Students **can determine the problem's topic and the facts** from the learning resources related to the subject matter.
				Fair	Students **can determine the facts** from the learning resources related to the subject matter.
				Not Good	Students **can't determine the topic of the problem, the facts, or the opinion presented** in the learning resources related to the subject matter.
			Students can define the problem of the impact of vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	Students **can distinguish facts, opinions**, and **norms** from the problem topic presented.
				Good	Students **can distinguish facts** and **norms** from the topic of the problem presented.
				Fair	Students **can distinguish facts** from the topic of the problem presented.
				Not Good	Students **can't distinguish facts, opinions**, and **norms** from the topic of the problem presented.
		Posing a problem	Students can propose problems related to the impact of vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	Students **can identify, state,** and **give responses** about the problem presented.
				Good	Students **can identify** and respond to the problem presented.
				Fair	Students **can identify** the problem presented.
				Not Good	Students **can't identify, state**, and **give responses** to the problem presented.
		Analyzing the problem	Students conduct group discussions to identify the impact of vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	**Four or more students will discuss** the problem together to identify it.
				Good	**Two to three students discuss together** to identify the problem.
				Fair	**Only one student identifies** the problem.
				Not Good	**Students need to discuss and identify** the problem.
2	Incubation		Students use learning resources	**Very Good**	Students use learning resources that are **appropriate to the learning material, appropriate to the automotive**

		Analyzing the impact of the problem	appropriate to the learning material of hydrocarbon compounds and petroleum.		**vocational program, and relevant to the problem topic.**
				Good	Students use learning resources that are **appropriate to the learning material** and **appropriate to the problem**.
				Fair	Students use learning resources that are **only by the learning material**.
				Not Good	Students use learning resources that **are not related to the learning material, the automotive vocational program**, or **the topic of the problem**.
			Students can consider the limitations of the impact of vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	Students **can limit the problem to be studied, emphasize the focus, present data that provides an overview of the focus**, and **students can determine its impact**.
				Good	Students **can limit the problem to be studied, emphasize the focus**, and **present data that provides an overview of the focus**.
				Fair	Students **can limit the problem to be studied** and **emphasize the focus of the problem**.
				Not Good	Students must **allow the problem to be studied**.
		Finding problem-solving solutions	Students can collect solutions to the problem of the impact of vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	Students **can collect problem-solving ideas, provide problem-solving responses**, and **respond according to the topic discussed**.
				Good	Students **can collect problem-solving ideas;** students **give problem-solving responses**.
				Fair	Students can collect problem-solving ideas.
				Not Good	Students **cannot collect problem-solving ideas** and **need to provide problem-solving responses**.
3	Illumination	Solving the problem	Students can generate ideas to solve the problem of the impact of vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	Students **solve problems. Their problem-solving ideas are based on the learning topic** and **provide unique ideas** not in the book or the teacher's thinking.
				Good	Students **solve problems,** and **the problem-solving ideas given by students are by the learning topic**.
				Fair	Students **solve the problem,** but **their problem-solving ideas do not follow the learning topic.**
				Not Good	Students **need help solving the problem**.

			Students can generate a goal to solve the problem of the impact of vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	Students **generate a problem-solving objective that aligns with the learning topic** and **characteristics of the automotive engineering skills program** and **can be applied**.
				Good	Students **generate a problem-solving objective according to the learning topic** and **characteristics of the automotive engineering skills program, but it is not applicable**.
				Fair	Students **generate a problem-solving objective according to the learning topic but not according to the characteristics of the automotive engineering skills program,** and **it cannot be applied**.
				Not Good	Students **need help to generate a problem-solving objective**.
4	Verification	Testing the product	Students can test the suitability of ideas to solve the problem of the impact of vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	Ideas generated by students in the form of **modified ideas or ideas by problem-solving objectives, learning resources**, and **learning topics can be applied** to overcome problems in everyday life related to automotive engineering expertise programs.
				Good	Students generate ideas in the form of **modified ideas or ideas based on problem-solving objectives, learning resources,** and **learning topics, but they cannot be applied** to solve problems in everyday life.
				Fair	The problem-solving objectives generate students' ideas, **modified or otherwise, but not with the learning topic**.
				Not Good	Ideas generated by students in the form of **modified ideas or ideas are not by the problem-solving objectives**.
		Compile a product development report.	Students can compile a product development report to address the impact of vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	The report prepared by students consists of indicators of the **product's name**, the **purpose of product development, how to use and store the product**, and an **explanation of STEM aspects** of product development.
				Good	The report prepared by students consists of indicators of the **product's name**, the **purpose of product development**, and an **explanation of STEM aspects** of product development.
				Fair	The report compiled by students consists of indicators of **the name of the product** developed and the **purpose of product** development.

				Not Good	Students **need to prepare a product development report**.
		Presenting the product	Students can present the products developed to solve the problem of the impact of vehicle exhaust emissions, diesel oil spills, or used oil waste.	**Very Good**	Students **present the product** in an **engaging**, **clear** and **systematic manner**.
				Good	Students **present the product interestingly** and **clearly**.
				Fair	Students **present the product**.
				Not Good	Students **cannot present the developed product**.

Table 2. Sub-aspects of the Student Creativity Product Rubric

No	Indicators	Sub-indicators	explanation	Category	Rubric
1	Novelty	Product originality	The originality of a product developed to solve the problems of vehicle exhaust emissions, diesel oil spills, or the impact of used oil waste is the result of one's idea.	**Very Good**	**According to the development objectives**, the student-developed product provides a **unique solution and supporting arguments**.
				Good	The developed product **provides a solution different from other students' products**. It is based on the **development objectives but is not accompanied by supporting arguments**.
				Fair	The developed product **provides a solution that is different from other students' products but needs to be based on the development objectives and accompanied by supporting arguments.**
				Not Good	The developed product **does not provide a solution, is not based on the development objectives**, and **is not accompanied by supporting arguments.**
		Product uniqueness	The product's uniqueness was developed to solve problems such as vehicle exhaust emissions, diesel oil spills, and the impact of used oil waste.	**Very Good**	The product **has an attractive shape, neatness,** and **a clear problem-solving function.**
				Good	The product **has an attractive shape** and **a clear problem-solving function.**
				Fair	The product **has an attractive shape.**
				Not Good	The product **has an unattractive shape.**
2	Usefulness	Product usefulness	The developed product helps solve the problems of vehicle exhaust emissions, diesel oil	**Very Good**	The resulting product **has more than one benefit, is by the learning topic and can be applied.**
				Good	The resulting product **has only one benefit, by the learning topic and can be applied.**

			spills, and the impact of used oil waste.	**Fair**	The resulting product **has only one benefit, by the learning topic,** but **cannot be applied.**
				Not Good	The resulting product **has only one benefit** but **is not based on the learning topic and cannot be applied.**
		Product suitability	The suitability of the developed product to solve the problem of vehicle exhaust emissions, diesel oil spills, or the impact of used oil waste.	**Very Good**	The developed product is **used to solve problems related to the subjects studied** and **to the automotive engineering expertise program**.
				Good	The developed product is **used to solve problems by the subjects studied but not with the automotive engineering skill program.**
				Fair	The developed product **solves the problem**, **not by the subjects studied or the automotive engineering skill program**.
				Not Good	The developed product **is not used to solve problems, is not used by the subjects studied, or needs to be part of an automotive engineering skill program.**
3	Relevance	Accuracy of science	Petroleum science's accuracy is used to solve problems such as vehicle exhaust emissions, diesel oil spills, and the impact of used oil waste.	**Very Good**	The developed product is **based on the lessons learned**, and the **learning topic can solve problems by the automotive engineering expertise program and solve problems in everyday life.**
				Good	The developed products are **based on the lessons learned by the learning topics** and **can overcome problems by the automotive engineering skill program** but **cannot overcome difficulties in daily life.**
				Fair	The products developed are **based on the lessons learned by the topic of impact learning** and **need help to overcome problems in the automotive engineering skills program and everyday life.**
				Not Good	The developed product is based on **the lessons learned rather than the learning topic**, so **it cannot solve problems in the automotive engineering skills program or everyday life.**
		Appropriateness of STEM aspect application	The accuracy of the STEM aspects used to develop the product to solve the problem of vehicle exhaust emissions, diesel	**Very Good**	The developed product covers **four aspects of STEM**: **chemical aspects of hydrocarbon and petroleum compounds, technological aspects that make it easier for humans to solve problems, design/engineering aspects by automotive engineering, and aspects of mathematical**

			oil spills, or the impact of used oil waste.		**calculations used to create products and solve problems.**
				Good	The developed product includes **chemical aspects of hydrocarbon and petroleum compounds, technological aspects that make it easier for humans to solve problems, and design/engineering aspects based on automotive engineering.**
				Fair	The developed product covers **chemical aspects of hydrocarbon and petroleum compounds and technological elements that make it easier for humans to solve problems.**
				Not Good	The developed product **only covers the chemical aspects of hydrocarbon and petroleum compounds.**
4	Effectiveness	The success of the product in facing the problem	The success rate of the product in dealing with the problem of vehicle exhaust emissions, diesel oil spills, or the impact of used oil waste.	**Very Good**	The developed product **successfully solves the problem**, is **completed according to the plan**, and **within the required time.**
				Good	The developed product **successfully solved the problem** and **was completed according to the plan.**
				Fair	The developed product **successfully solved the problem**, but **it was not completed according to plan and not in the required time.**
				Not Good	The developed **product needs to be more successful to solve the problem.**
		Appropriateness of selection of tools and materials	Appropriateness of the selection of tools and materials to develop products used to address the problems of vehicle exhaust emissions, diesel oil spills, or the impact of used oil waste.	**Very Good**	The **tools and materials** used to develop the product to solve the problem are **strong**, **durable**, and **economical**.
				Good	The **tools and materials** used to develop products to solve problems are **solid** and **durable but need to be more economical.**
				Fair	The **tools and materials** used to develop products to solve problems are **firm**, **not durable or economical**.
				Not Good	The **tools and materials** used to develop products that solve problems **are not strong, durable, or economical.**
5	Practicality	Ease of product use	Ease of use of the product developed to solve the problems of vehicle exhaust emissions, diesel oil spillage, or waste oil impact.	**Very Good**	Products are used **quickly and simply** to solve problems by **automotive engineering technical program students, the automotive vocational school community**, and **laypeople.**
				Good	Products that can be used **easily and simply** by **automotive engineering students** and **the automotive vocational school community to solve problems are unavailable to lay people.**

				Fair	The product is only used **quickly and simply** by **automotive engineering students to overcome problems.**
				Not Good	**Automotive engineering students, the vocational school community, and laypeople cannot use the product.**
		Ease of product storage	Ease of storage of the developed product to solve the problem of vehicle exhaust emissions, diesel oil spills, or the impact of used oil waste.	**Very Good**	Product storage **can be stored easily and safely (does not cause problems)** and **can maintain the quality of the developed products.**
				Good	Product storage **can be done easily and safely (does not cause problems), but it cannot maintain the quality of the developed product.**
				Fair	Product storage **can be stored easily but may need help to maintain the quality of the developed product.**
				Not Good	Product storage **is not easy, may cause problems, and cannot maintain the quality of the developed product.**