

	description	action	visual input	verbal input	fast learner	slow learner
topic	intro to nanocomposite					
title	“DIY: make your own nanocomposite”					
aim	provide general overview about nanocomposite preparation techniques so that students can make their own nanocomposite for their graduation exhibition					
ice breaker (intro game)	guess which product is made up of nanocomposite material	put several products on the desk in advance, once students are seated, ask them to distinguish which product is made up of nanocomposite material	need several products which made up of different materials, such as steel, aluminum, titanium, nanocomposite, etc.	<i>Welcome to “DIY: make your own nanocomposite”. Before we start, I have a game for you to play...</i>	Give students pencil & paper. Offer bonus points to fast learner students who can distinguish the product made up of nanocomposite material.	Teacher writes down the material of each product on the blackboard so that slow learners can use it as reference.
objectives (breakdown of content)	1. know the difference between macro- and nano- scales 2. understand the composition of nanocomposite 3. know the main advantage of nanocomposite 4. know the application of nanocomposite 5. learn how to prepare nanocomposite	distribute handouts in class	handouts have clear numbering for easy-reading & content is mostly in picture-form	<i>Today we will learn 5 things. Look at the checklist sheet. Let's start with No. 1...</i>		
instruction (what teacher does/says)	quick run through of all 5 objectives, showing examples, & answering questions if any	alternate between clicking through PowerPoint slides and showing actual nanocomposite sample in hand	PowerPoint slides	<i>Here I will teach you how to make nanocomposite by yourself...</i>	Teacher asks a few questions during the class. Offer bonus points for fast learner students who can answer the question correctly.	Teacher reveals the answer and encourages the slow learners to read more books about nanocomposite after class.
activity (what student does/ produces)	students prepare the nanocomposite in pairs, groups, or individually	students prepare the nanocomposite while teacher supervises	teacher shows the process of preparing nanocomposite step by step	<i>Now it is your turn to make your own nanocomposite...</i>	Provide samples prepared by teacher as reference for those who are done faster.	Teacher walks to the students who seem to need help and show them how to prepare the nanocomposite correctly.
output (evidence of learning)	1. nanocomposite prepared by student showing different shape of nanoparticles 2. nanocomposite prepared by student showing different volume fraction of nanoparticles 3. nanocomposite prepared by student showing different orientation of nanoparticles 4. nanocomposite prepared by student showing good or poor distribution uniformity of nanoparticles					
assessment (criteria for measurement)	students regroup for show-and-tell open discussion	students reconvene, hand in their nanocomposite samples to teacher, view each other's sample, & talk about it	teacher shows all the nanocomposite samples prepared by the students	<i>Look...John's product is pretty good because...</i>	Encourage the fast learners to share their nanocomposite samples with their parents and friends.	Encourage the slow learners to complete the unfinished objectives at home on their own.
outcome	students leave feeling they know a little bit of everything about nanocomposite					