EM shower development in lead and iron

- Where is the shower maximum, in numbers of X_0, for:
  - A 100 GeV electron in lead?
  - A 1 TeV photon in lead?
  - A 100 GeV electron in iron?
  - A 1 TeV photon in iron?
- How many cm of Pb or Fe are needed to stop (meaning a loss of 95% of their energy) a 100 GeV electron? And a 1 TeV photon?
- For EM showers, is it better to have lead or iron?

material	Z	A	ρ	dE/dx	λ_0	X_0	R_M	ϵ
			[g/cm^3]	[MeV/cm]	[cm]	[cm]	[cm]	[MeV]
Al	13	27.0	2.70	4.37	37.2	8.9	4.68	39.3
Liq. Ar	18	40.0	1.40	2.11	80.9	14.0		29.8
Fe	26	55.9	7.87	11.6	17.1	1.76	1.77	20.5
Cu	29	63.5	8.96	12.9	14.8	1.43	1.60	18.7
W	74	183.9	19.3	22.6	10.3	0.35	0.92	7.9
Pb	82	207.2	11.35	12.8	18.5	0.56	1.60	7.2
U	92	238.0	18.95	20.7	12.0	0.32	1.00	6.6
NaI			3.67	4.84	41.3	2.59		12.4
Plastic scintillator			1.032	2.03	68.5	42.9		87.1

Properties of CsI crystal

Density: 4.51 g.cm^{-3}, Ec = 11.17 MeV

	Atomic Mass	X_0 (g.cm^{-2})	R_M(g.cm^{-2})
Cs	132.9	8.31	15.53
I	126.9	8.48	15.75

- CsI crystal
  - Compute the radiation length of a CsI crystal (in g.cm^{-2})
  - Give X_0 in cm
  - What is its Moliere radius (g.cm^{-2} and cm)